U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-257 474

Survey of User Acceptance of the Solid Waste Removal Systems at Operation Breakthrough Sites

Hittman Associates, Inc.

Prepared for

Municipal Environmental Research Lab, Cincinnati, Ohio Wastewater Research Div

Sep 76

TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA-600/2-76-229	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE SURVEY OF USER ACCEPTANCE OF THE SOLID WASTE REMOVAL SYSTEMS AT OPERATION BREAKTHROUGH SITES		5. REPORT DATE September 1976, Issuing Date 6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) Martin V. Bloom William D. Quarles		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Applied Management Sciences Silver Spring, Maryland 20910 Under subcontract to Hittman Associates, Inc.		10. PROGRAM ELEMENT NO. P.E.1BC611 11. CONTRACT/GRANT NO. 68-03-0094
12. SPONSORING AGENCY NAME AND ADDRESS Municipal Environmental Research Laboratory Office of Research and Development U. S. Environmental Protection Agency Cincinnati, Ohio 45268		13. TYPE OF REPORT AND PERIOD COVERED Final 14. SPONSORING AGENCY CODE EPA-ORD
15. SUPPLEMENTARY NOTES		

16. ABSTRACT

This report presents case studies of the solid waste disposal characteristic and resident attitudes about solid waste disposal methods at eight Operation Breakthrough sites. The data included in the report were obtained through on-site interviews of 1023 households and eight representatives of site management. The survey wa conducted during the period of January through March 31, 1975.

The report includes resident and management perceptions of the adequacy of trash storage and collection facilities and services, waste storage requirements and practices, and of the suitability of the system to the environment. The data do not constitute a technical evaluation of the solid waste management system at each facility and no on-site inspections of facilities were conducted to verify conditions reported by the residents. The findings do, however, represent user perceptions of the effectiveness of alternative methods of trash collection as those methods relate to different housing settings.

This report is submitted in fulfillment of Contract No. 68-03-0094 by Hittman Associates, Inc. The report was prepared under subcontract by Applied Management Sciences, Inc., of Silver Spring, Maryland. The project was sponsored by the Environmental Protection Agency in cooperation with the U.S.Department of Housing and Urban Development. Work was completed in February, 1976.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Refuse*, Acceptance*, Collection*, Removal, Storage, Surveys*	Operation Breakthrough Department of Housing and Urban Development	13B 15E 14B

18. DISTRIBUTION STATEMENT RELEASE TO PUBLIC	19. SECURITY CLASS (This Report) UNCLASSIFIED	21. NO. OF PAGES 315
ia	20. SECURITY CLASS (This page) UNCLASSIFIED	22. PRICE $9.75-2.25

EPA Form 2220-1 (9-73)

PRICES SUBJECT TO CHANGE

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EPA-600/2-76-229
September 1976

SURVEY OF USER ACCEPTANCE OF THE SOLID WASTE REMOVAL SYSTEMS AT OPERATION BREAKTHROUGH SITES

by

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Contract No. 68-03-0094

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This study was conducted
in copperation with
Office of Policy Development and Research
Division of Energy, Building Technology and Standards
U.S. Department of Housing and Urban Development

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FOREWORD

The Environmental Protection Agency was created because of increasing public and government concern about the dangers of pollution to the health and welfare of the American people. Noxious air, foul water, and spoiled land are tragic testimony to the deterioration of our natural environment. The complexity of that environment and the interplay between its components require a concentrated and integrated attack on the problem.

Research and development is that necessary first step in problem solution and it involves defining the problem, measuring its impact, and searching for solutions. The Municipal Environmental Research Laboratory develops new and improved technology and systems for the prevention, treatment and management of wastewater and solid and hazardous waste pollutant discharges from municipal and community sources, for the preservation and treatment of public drinking water supplies, and to minimize the adverse economic, social, health, and aesthetic effects of pollution. This publication is one of the products of that research; a most vital communications link between the researcher and the user community.

This survey report summarizes the attitudes of residents toward the solid waste collection systems in their innovative high population density communities. Such feedback of residents' acceptance is a valuable tool in measuring the effectiveness of a solid waste management technique.

Francis T. Mayo, Director
Municipal Environmental Research
Laboratory

ABSTRACT

This report presents case studies of the solid waste disposal characteristics and resident attitudes about solid waste disposal methods at eight Operation Breakthrough sites. The data included in the report were obtained through on-site interviews of 1023 households and eight representatives of site management. The survey was conducted during the period of January through March 31, 1975.

The report includes resident and management perceptions of the adequacy of trash storage and collection facilities and services, waste storage requirements and practices, and of the suitability of the system to the environment. The data do not constitute a technical evaluation of the solid waste management system at each facility and no on-site inspections of facilities were conducted to verify conditions reported by the residents. The findings do, however, represent user perceptions of the effectiveness of alternative methods of trash collection as those methods relate to different housing settings.

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TABLE OF CONTENTS

Page

Acknowledgments vi
Introduction. 1
Summary 3

Chapter
1 Jersey City, New Jersey. 16
2 Indianapolis, Indiana. 47
3 Seattle, Washington. 93
4 Kalamazoo, Michigan. 116
5 King County, Washington. 154
6 Macon, Georgia 191
7 Memphis, Tennessee 223
8 Sacramento, California 252

Appendix A - Survey Procedures 283
Appendix B - Site Management Questionnaire. 289
Appendix C - Resident Questionnaire 295

ACKNOWLEDGMENTS

The cooperation of the residents and management of the eight Operation Breakthrough sites surveyed is deeply appreciated. A special word of thanks is extended to Mr. Jerome Rothenberg of the Department of Housing and Urban Development for his assistance in facilitating and coordinating the survey involvement with site management. The direction of Hittman Associates Incorporated, and particularly Mr. Jack Overman, Program Manager, was invaluable to the conduct of this effort.

Gratitude is also expressed to the site management representatives who participated in the survey: Ms. Barbara Tilman, Summit Plaza, Jersey City, New Jersey; Mr. R. Donoho and Mr. Jack Almerick, Park Lafayette, Indianapolis, Indiana; Mr. Ron Griffin, Bryant Manor, Seattle, Washington; Ms. Susan Vogt, New Horizon Village, Kalamazoo, Michigan; Mr. Earl Tarble, Lendemain, King County, Washington; Mr. G. Messmore, Crystal Lake, Macon, Georgia; Ms. Anne Dexter, Edison Park, Memphis, Tennessee; and Mr. B. L. Davis, Greenfair, Sacramento, California.

INTRODUCTION

The reader is cautioned that the data, findings and recommendations contained within this report are based on the perceptions of residents and site management personnel at Operation Breakthrough sites. These survey data are not intended to be a technical evaluation of the solid waste management system at each site. Further, no on-site inspections were conducted to verify conditions reported by the residents.

The Survey of Solid Waste Removal Systems for Residents of Operation Breakthrough Sites is part of a study conducted by Hittman Associates, Inc. for the Environmental Protection Agency. The survey was conducted under subcontract by Applied Management Sciences.

The U.S. Department of Housing and Urban Development's Operation Breakthrough is a large research and development program designed to evaluate industrialized housing production and innovation. An innovation in solid waste removal, a pneumatic collection system, was installed at the Jersey City, New Jersey site.

More conventional collection systems were utilized at the other sites.

As part of the overall evaluation required for the innovative system, residents were surveyed at the Jersey City site and seven other Operation Breakthrough sites to learn their perceptions of and reactions to the various trash storage, handling, and collection methods in use at those sites.

Respondents were queried in these areas:

- Adequacy of trash storage and collection facilities and services
- Trash and bulky waste storage requirements and practices of residents
- Resident awareness of, and opinions about, the solid waste disposal system operations, costs, and their responsibilities and point of interaction for resolving problems
- Suitability of the system to the environment

The findings represent user perceptions of the effectiveness of alternative methods of trash collections as they relate to different innovative housing settings. No socio-economic comparisons were made; rather, the comparisons contained within each case study are made between residents of single family dwellings and residents of multiple family dwellings.

Site specific recommendations were made and are based on the conclusions drawn from site management and resident respondents.

SUMMARY

SECTION 1

OVERVIEW OF THE RESEARCH METHODOLOGY

Very little data exist on general public attitudes about trash collection and, at the inception of this survey, Operation Breakthrough site resident attitudes about trash collection were unavailable.

Initially, residents at Operation Breakthrough sites in these areas were to be surveyed:

- Jersey City, New Jersey
- Indianapolis, Indiana
- Seattle, Washington
- Kalamazoo, Michigan
- King County, Washington
- Macon, Georgia
- Memphis, Tennessee
- Sacramento, California
- St. Louis, Missouri

St. Louis was eliminated from the study because of site management' unwillingness to participate in the survey.

Prior to the beginning of the data collection activity, extensive effort was directed toward the construction of a set of survey instruments. At the start of the project, Applied Management Sciences had been supplied with a draft of a resident questionnaire This questionnaire provided a starting point for the development of the Resident and Site Management questionnaires which were the primary data collection instruments employed in this survey.

The major deficiency of that initial instrument was the absenc of several areas of inquiry. Questions designed to identify specia refuse handling practices or requirements (such as trash separation and to gauge each resident's awareness of the nature of the site's refuse collection system were incorporated into the Resident Questionnaire. Further, several sections were devised to allow the examination of the differing utilization and requirements of residents of single family and multi-family units. The questionnaire was then structured along functional lines: solid waste storage, handling, and removal.

As the Resident Questionnaire was being formulated, a parallel process was being used in the development of the Site Management Questionnaire. Items designed to provide a basis for comparing resident perceptions with management statements (about such matters as the frequency of trash collection, waste disposal regulations, and the collection service provider for example) were included in this instrument.

It should be noted that this process of instrument building was supported by several reviews with representatives of the prime contractor and the government agencies involved. These reviews were invaluable as several revisions were undertaken to ensure the pertinance and ease of administration of each instrument. Further, each questionnaire was pretested several times before its actual administration in the field.

The actual interviews were conducted during the period of January 20 through March 31, 1975. Experienced interviewers, in the employ of market research firms local to each site, administered the Resident Questionnaire.

A random sample of residents was selected for the various types of units available at each site. Each site was considered a separate subsample for the purpose of sample selection and for the number of required interviews for completion. The proportion of completed interviews for each unit approximated the proportion of that type of unit at the site. If, for example, one third of a site's housing is multi-family low rise, then one third of the interviews were conducted with residents of multi-family low rise units.

The interviews were conducted during the evening to assure the presence at home of sufficient numbers of respondents.

Site Management Questionnaires were administered by Applied Management Sciences' resident staff. The management representative of each participating site was cooperative and each was available for the recontact that was necessary in several instances for the collection of missing data or the clarification of information seemingly at odds with resident responses.

Applied Management Sciences had assured the delivery of data with a minimally acceptable error of 10 percent at a 90 percent confidence interval; the data obtained are accurate to within 3 percent at that level.

The universe of Operation Breakthrough Sites (exclusive of the St. Louis site) contains 2471 units operating at an 85 percent level of occupancy. Data derived from site interviews were require to be accurate to within ± 10 percent of true universe values at a 90 percent level of confidence.

Given a sample of 1023 units, the confidence interval for sample data at the 90 percent level of confidence may be derived from the following formula:

$$\frac{d^2 = t^2pq}{n}$$

where d = the confidence interval expressed as a percentage
t = the value of the ordinate of the "t" distribution associated with the desired level of confidence
p = the expected occurrence of a given universe characteristic expressed as a proportion
q = p(1-p)
n = the size of sample

As the universe is in excess of 400 units, it is large enough to be considered "infinite" for statistical purposes. Consequently at the 90 percent level of confidence:

$$t = 1.65 \text{ (two-tailed)}$$

Furthermore, if p = .5, the obtained value of d will be maximally conservative:

$$d^2 = \frac{(1.65)^2\ (.5)^2}{1023}$$

$$d^2 = .00066$$

$$d^2 = \pm .026$$

Hence, population estimates derived from the sample of Operation Breakthrough sites are accurate to within at least ± 2.6 percent of the true population values at the 90 percent level of confidence.

Concurrent with the field interviewing, a total of 44 tables were developed for each site to facilitate the analysis of the residents' survey results. The major areas of analysis included:

- Practices and needs of residents in disposal of their bulky wastes, separation of wastes, in-house waste storage, external waste storage, and location of disposal sites.
- The residents' understanding of their responsibilities for trash disposal stemming from site rules and regulations.
- Resident awareness of costs and charges for solid waste collection and disposal services and frequency of services.
- Resident perception of the suitability of their site's solid waste disposal system to the environment noting specific incidence of the extent of noise, odors, trash spillage, pests, nuisance caused by uncontrolled household pets, and weather effect.
- Resident attitudes towards the operation and management of the site's solid waste disposal system, with particular attention to the incidence of frequency of use, mechanical failure of equipment, adequacy of equipment capacity, regularity of service, potential dangers, convenience of system components, environmental impact and responsiveness of site management and trash service providers in resolving problems.

For analytical purposes at each site these research areas were cross-tabulated against the following types of resident characteristics:

- Type of dwelling
- Retirement status
- Number of residents per household, by adults and children
- Frequency of in-house storage capacity fillup per week
- Presence of compactors
- Trash separation requirements
- Number of storage cans per week
- Provider of trash collection service, e.g., municipal agency, housing management, private contractor, and so forth
- Tenure at site, in months

The results of such analyses were then compared with the attitudes, impressions, and statements on operations characteristics expressed by site management personnel, including site rules and regulations to arrive at an overall conclusion on the acceptability and suitability of the solid waste disposal system at each site.

At the completion of editing and coding activities, a keypunch card format was developed and sent with the editing and coding manual and resident questionnaires to be keypunched and verified. EDP cards were then listed and checked for errors and the file errors were corrected.

The program chosen to build the master file, sub-files (each site), and tabular output was the Statistical Package for Social Sciences (SPSS) Version Six. Using this program summary listings of all variables, tabular listings of variable frequencies, initial cross-tabulation formats, and sub-files were developed for each site. After these had been run and checked, a test run of one site was made, reviewed, and corrected. Finally, tables for all the other sites were run and produced. Information contained in these tables was used, in conjunction with the report outline and analytic plan to prepare findings, conclusions, and recommendations.

SECTION 2

STRUCTURE OF THE CASE STUDIES

The eight case studies are structured to provide in-text and tabular format the following information:

- A brief physical and environmental description of the site.
- A discussion of characteristics of site housing in terms of type and number of units, ownership and occupancy, costs of housing, and length of resident tenure.
- A summary statement of the site manager's understanding of the extent of solid waste disposal/collection facilities and services, his expectation of resident practices in storing and disposing solid wastes, regulations governing resident storage and disposal actions, and use of facilities and services and limitations and charges for services.
- A discussion of the solid waste items which are disposed of by residents, their methods of disposal and use of equipment for such disposal, compared to the site rules and regulations governing such disposal practices for bulky wastes, separation of waste and other related issues.
- Findings on the awareness of residents about their responsibilities for complying with site management policies on bulky waste trash removal, waste separation, and payments and costs of solid waste removal services.
- Findings on the suitability of the site's solid waste collection system to the environment, as perceived by residents. Such perceptions take into account the existence of noise, odors, trash spillage, insects and vermin, household pet nuisances, and effects of weather.
- Findings of the measures of residents' attitudes and impressions about the effectiveness of their site's solid waste disposal system and the system's special facilities and equipment components such as trash compactors, external storage cans and bins, and trash collection services.
- Site-specific recommendations based on the findings.

SECTION 3

SUMMARY OF MAJOR FINDINGS AND RECOMMENDATIONS

Analysis of the data collected at each site yielded site-specific findings in the following areas:

- Adequacy of trash storage and collection facilities and services
- Waste storage requirements and practices
- Resident awareness of and opinions about the system
- Suitability of the system to the environment

3.1 Findings

- Generally, the respondents at the Operation Breakthrough sites find the trash storage and collection facilities and services adequate.
- However, complaints of inadequate facilities come from upwards of 40 percent of the respondents at most sites.
- There appears to be no major relationship between the involvement of site management personnel in the operation of a waste disposal system and resident satisfaction with that system.
- At most sites there are substantial numbers of residents who don't comply with site regulations which specify the operation of disposal equipment and the manner in which trash is to be disposed. Resident non-compliance, in fact, has on occasion resulted in major equipment failures at the Jersey City, New Jersey site.
- Except where required by site management, and there is a compliance problem at those sites, relatively few respondents separate other than large bulky items out of their regular wastes.
- Resident awareness of major features of the trash disposal systems is limited at most sites. This low awareness is not only restricted to innovations at the site but extends to such matters as the frequency of collections and the providers of disposal services.

- Respondents at most sites report a significant number of environmental problems ranging from insects and odors to scattering of trash by weather and household pets.
- A number of respondents at most sites see hazards in the use of the disposal systems at the sites. These hazards include fear of falls and physical disability and apprehensions about criminal assault. This latter fear was expressed by a number of Jersey City respondents.

3.2 Recommendations

Site-specific recommendations were made consequent to the findings evident from the data collected at each site. Among them are:

- Recommendations for greater involvement of site management in monitoring the waste disposal systems at some sites. Of note are the suggestions that site management serve a clearinghouse function to focus resident complaints about the adequacy of collection services and that management mediate disputes between residents and service providers.
- Recommendations that site management personnel at some sites survey the disposal facilities for physical hazards to residents (especially the aged) and for locations which provide (because of poor lighting or seclusion) places where criminal assaults may occur.
- Recommendations that site management personnel begin publicity and enforcement campaigns to heighten resident compliance with disposal regulations. Such compliance would be instrumental in combatting some of the reported environmental deficiencies of some systems.
- Recommendations for increasing either storage capacity or the frequency of collection at some sites to combat environmental deficiences in the current systems.

SECTION 4

SUMMARY OF SITE SPECIFIC FINDINGS AND RECOMMENDATIONS

A product of the analysis process described earlier is a set of findings and recommendations specific to each site. These findings reflect the circumstances and problems peculiar to each site; the recommendations are structured to encompass the unique aspects of each site and to provide workable solutions within the resources realistically available to each.

The following is an overview of the findings and recommendations for each site report.

4.1 Jersey City

The Jersey City site employs the pneumatic transport system. This system serves the residents of the 486 multi-family units present at this site.

Among the findings and recommendations:

- A finding that improper resident use of trash chutes causes occasional overloading and back-ups in the system.
- A finding that some respondents fear being criminally assaulted as they move their trash to the compacter closets.
- A finding that respondents are generally pleased with the solid waste disposal system.
- A recommendation that site management strengthen enforcement of existing rules regulating the use of trash chutes.
- A recommendation that site management collect information from residents about the dangers of criminal assault in the use of the disposal system and present this information to the police.

4.2 Indianapolis

The Indianapolis site is serviced by a stationary bin/plastic bag system. The site itself contains 295 units of single and multi-family housing.

Among the findings and recommendations:

- A finding that most respondents are unaware of the nature and operation of the site's solid waste disposal system.
- A finding that chronic overloading of the central storage bins causes littering, odors, pet and weather scattering of garbage, and problems with insects and vermin.
- A finding that respondents are generally pleased with the waste disposal system.
- A recommendation that site management establish a dialog with residents about use of the waste disposal system.
- A recommendation that limitations be placed on the volume of garbage each household may contribute to the disposal system.
- A recommendation that drainage or windscreen facilities be studied to prevent weather scattering of garbage.

4.3 Seattle

A bulk container system provides trash storage and collection service for the 58 multi-family units here.

Among the findings and recommendations:

- A finding that over half of the respondents saw potential personal hazards (primarily from falls and criminal assault) in their use of the external storage facilities.
- A recommendation that management survey and correct physical features of the disposal system which might cause falls.
- A recommendation that site management secure the trash bin areas to lessen resident fears of criminal assault.

4.4 Kalamazoo

There are 245 single and multi-family dwelling units at this site. Individual external storage cans are used by single family unit residents and a trash compaction system serves the multi-family units.

Among the findings and recommendations:

- A finding that 60 percent of the single family respondents report frequent overloading of the external containers.

- A finding that household pets worsen the problem of scattered trash at this site.
- A recommendation that improvements in the frequency of collection or capacity of external storage be made to solve the overloading experienced by some site residents.
- A recommendation that the site management improve externa storage facilities for single family residents to make these facilities less susceptible to the scattering of trash by household pets.

4.5 King County

A private contractor provides curbside or garage trash pickup service for the residents of the 178 units of single and multifamily housing at this site.

Among the findings and recommendations:

- A finding of serious problems with the waste collection services at this site including rude collection personnel, trash scattering, uncollected trash, and a shortage of containers.
- A recommendation that the Homeowners Association take an active role in monitoring the collection system.
- A recommendation that improvements be made in the qualit of the collection service.

4.6 Macon

Dumpsters are the major form of storage and collection facilities available to the residents of the 287 single and multi-famil units at this site. Single family unit residents are required to dispose of their trash in the containers.

The site report contains:

- A finding that noncompliance with the site regulation that trash be disposed in the containers is aggravating environmental concerns.
- A recommendation that efforts be made by site management to bring all residents into compliance with the requirements for proper container utilization.

4.7 Memphis

The Memphis site contains 518 single and multi-family units. Centrally located bins serve the single family units while chute-fed containers service residents of the multi-family structure.

The site report contains:

- A finding that a shortage of containers contributes to overloading which aggravates environmental concerns.
- A recommendation that site management provide either additional storage containers or more frequent trash collection.

4.8 Sacramento

The 407 single and multi-family units at this site are served by a municipal agency which empties curbside containers and dumpsters in use.

Among the findings and recommendations:

- A finding of limited problems with the waste collection services at this site including trash scattering, uncollected trash, and a shortage of containers.
- A recommendation that management personnel take an active role in monitoring the collection system.
- A recommendation that improvements be made in the quality of the collection service.

1

JERSEY CITY, NEW JERSEY

SECTION 1

CONCLUSIONS

Based on analysis of the data collected from the site manager and residents of the Summit Plaza Apartments, conclusions were developed from management and resident perceptions and attitudes on the following issues:

- Adequacy of trash storage and collection facilities and services and compliance of residents with rules and regulations governing trash storage and disposal
- Trash and bulky waste storage and disposal requirements and practices of residents
- Resident awareness of and opinions about the solid waste disposal system operations, costs, their responsibilities and point of interaction for resolving problems
- Suitability of the system to the environment

1.1 Conclusions About Site Management's Attitudes and Impressions

The Site Management Interview was conducted on January 22, 1975. The Site Management representative expressed no overall opinion about the suitability of the system or the extent of resident problems. However, Site Management encounters some serious problems in obtaining the cooperation of some of the residents in making proper use of the trash disposal facilities. Such concern is expressed in a December 1974 "Urgent Notice" to tenants. The specific problems cited by management are: residents breaking the pneumatic trash chute equipment by forcing large and small bulky wastes into the chute door; residents causing the system to back-up by their failure to push their disposed trash all the way down the trash chutes; some residents, primarily small children, leaving "wet garbage" and food wastes on the floor of the compactor closets (trash room) or in halls or stairways; some residents improperly wrapping their trash, particularly food wastes which cause unclean and unhealthful conditions in the trash chute areas when the system does not properly operate.

Summit Plaza management is apparently committed to preserving the cleanliness and liveability of the site by promulgating rules, by enforcing the rules, and by providing a high level of maintenance support to cleaning solid waste disposal facilities and assisting residents in the removal of large bulky wastes.

1.2 Conclusions About the Residents' Requirements, Attitudes and Opinions

Summit Plaza households are typically small to moderate in size with 2 to 4 persons per unit, two or more adults per household (with up to two children) is the most frequent occupancy pattern. The volume of household wastes generated by residents is small to moderate compared to other types of housing. In-house storage capacity is limited. Because of the congregate nature of housing, wastes are not stored outside the housing unit but are disposed of in trash chutes and a pneumatic trash collection and compactor system.

Most of the respondents (55 percent) use grocery bags to store their in-house trash. A large group (40 percent) used plastic trash bags with or without storage cans. The most common items stored in these in-house containers, in order of frequency, are: food wastes, paper and packaging, plastic items, cardboard items, newspapers, glass bottles and magazines.

On the average, residents fill their in-house storage containers approximately four times per week. The larger households (families with two adults and children) fill their in-house capacity daily or more.

A large number of residents separate bulky wastes from regular trash and request assistance from site management for the removal of such large wastes. A significant number of residents also separate glass bottles, jars, newspapers, and magazines from their regular trash.

In terms of waste disposal practices, almost all of the residents (154 of 164) report that they use the trash chutes regularly to dispose their household wastes. Several (6) reported that they use the trash room or central compactor. These people may represent the small number of people who are not making proper use of the trash chute, and are leaving their wastes in halls, stairways or on the floor of the trash room; or, there are some residences that do not have direct access to a chute, and these six may be representative of those residences.

Most of the residents (79 percent) feel that the trash disposal services and facilities are adequate. The common complaint among residents who feel that the facilities are inadequate is that they encounter chute back-ups which cause trash spillage or result in storage of wastes on the trash room floor. This problem leads other residents to complain that the trash room is too small. Actually, the trash room is designed to be a closet to place the trash chute. It is not designed for open trash storage. Some residents also complain that the trash chute door opening is too small or is difficult to operate. Only one resident finds the site's trash disposal system environmentally inadequate, but he does not give a specific reason for this feeling. There are no complaints about odor, insects, dog nuisances, vermin or weather effects, which indicates that site management is doing a good job in maintaining the order and cleanliness of the compactor closets despite resident abuses leading to trash spillage and on-floor storage of wastes.

The placement of trash chutes seems sufficiently convenient to residential units except for those on the ground-level floor of one of the buildings. Generally, residents do not move their trash more than 20 to 28 feet from their front door. Most of the residents feel that there were no dangers in moving their trash to the chute closets.

Seven respondents report fears or actual incidence of criminal assault related to the removal of wastes from their apartments. These seven complaints are from high-rise residents and probably relate to one or two isolated incidents of assault in their area of the site. Summit Plaza Apartments is located very close to the central city and may be prone to such occurrences; however, the matter warrants careful attention by site management and the local police authorities.

Generally, residents are pleased with the site manager's interest in and capability to solve their problems. Thirty-one of thirty-three complaining residents mention that site management has solved problems related to trash disposal to the residents' satisfaction.

None of the residents is aware of the specific portion of his rent which is allocated to paying for waste collection and disposal facilities and services. However, four residents feel that the costs are "about right" relative to the level of services received. Residents are also somewhat aware of the innovative solid waste disposal facilities in use at the site. A significant number (15 percent) are aware that the pneumatic trash collection system/central compactor system or its elements are an innovation.

SECTION 2

RECOMMENDATIONS

Based on the conclusions, recommendations are warranted to:

- Improve resident usage of the trash chute disposal system
- Overcome limited, but identifiable, resident concerns about criminal assaults encountered in using the compactor closets.

Both of these are discussed below.

2.1 Improvements of Resident Usage of the Trash Chute Disposal System

Site Management has taken specific steps, in the form of published rules and regulations, to obtain resident support in making proper use of the trash chutes. Specific instructions are issued which ask residents to push their trash all the way down the chute, to refrain from asking their small children to dispose of trash, and to refrain from leaving trash on the floor of the trash room or in halls or stairways.

If these rules are not effective, site management should take other steps to obtain compliance from specific residents who are not cooperating. Such steps might include levying charges for each violation or eviction for repeated offenses.

2.2 Criminal Assault

This problem is clearly serious. Management should informally ask residents in the high-rise areas for information on specific incidents, if such information has not already come to the management's attention. This information should then be presented to the local police department.

SECTION 3

PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

9

3.1 Size and Location of Site

The Summit Plaza Apartments Operation Breakthrough Site consists of 6.35 acres. The site is located in the high density center of Jersey City, New Jersey, and is one block from Journal Square, the city's Central Business District. From the site, there are views of Manhattan, Hudson and Newark Bays, and the Hackensack Meadows. Manhattan is 20 minutes away by rapid transit.

3.2 Land Characteristics

The site is a dense urban area bound by the St. John's high-rise apartment complex on the north, a public library on the southeast corner, Newark Avenue on the south, John F. Kennedy Boulevard on the west, and Summit Avenue on the east.

3.3 Description of Site

The site contains 486 units of high density building types. These have been characterized as multi-family medium-rise and high-rise structures. The overall density of the site is approximately 80 units per acre. The buildings have been massed to avoid the regimental, monotonous arrangements, typical of many high density multi-story developments. Housing units are located in tiered buildings and towers ranging from three to 18 stories.

A linear structural development approach was linked together with pedestrian concourses, plazas, and open space at various levels. Parking was planned at .67 cars per unit. A substantial amount of site parking was planned to lie below buildings and/or decks. The circulation of service vehicles was planned to minimize its visual impact on the site.

Approximately 3.7 acres of the site's 6.35 acres provide active and passive open space. This open space was a much needed addition to the area which had no open space within a 10-minute walk from the site.

SECTION 4

CHARACTERISTICS OF SITE HOUSING

A discussion of the characteristics of the site is presented in this section. The focus is on amount and type of housing rather than on the physical and/or architectural housing characteristics. The occupancy level, length of resident occupancy, and housing costs are also discussed.

4.1 Types and Numbers of Housing Units

Three different types of housing exist at Summit Plaza, and all are multi-family units: one low-rise apartment (MFLR) which is a three-story structure; two medium-rise dwellings (MFMR) which are six stories high; three high-rise buildings (MFHR) which range from 11 to 18 stories in height.

In total the site has 486 units. The largest group falls under the MFHR classification with 410 units, ranging in size from efficiencies to four-bed-room apartments. Next in number are the MFMR apartments with 64 units, ranging in size from one to four bedrooms. The MFLR building contains only 12 units which range from two to four bedrooms.

From the 486 total units at the site, 164 units comprise the sample for the resident survey. All data presented are derived from the sample which was stratified by housing type as follows:

- Multi-family low-rise - 4 units
- Multi-family high- and medium-rise - 160 units

Figure 1 below presents information on the size of the units and the range of rental fees.

Housing Type	Number of Bedrooms	Monthly Rental Range
MFLR	1 to 4	$159.86 to $298.46
MFH/MR	Efficiency to 4	$265.73 to $496.13

FIGURE 1: RENTAL RANGES BY HOUSING TYPE.

4.2 Occupancy

The site manager was interviewed on January 22, 1975. The site manager reports that MFLR and MFH/MR are at a 99-percent occupancy level. The site manager feels "full occupancy" is 100 percent but is uncertain when that figure will be reached due to continual resident turnover.

The length of occupancy (tenure) is an important characteristic to note as it provides a baseline of resident experience against which to measure attitudes and perceptions about the site and the solid waste disposal system. Tenure ranges from less than three months to more than 18 months across the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	DWELLING TYPE				No. and % by tenure	
	MFLR		MFH/MR			
	No.	%	No.	%	Total	%
Less than 3	1	25	15	9	16	10
4 to 6	2	50	66	41	68	41
7 to 9	1	25	63	40	64	39
10 to 12	0	0	10	6	10	6
13 to 18	0	0	2	1	2	2
More than 18	0	0	4	3	4	4
Total	4	100%	160	100%	164	100%
Average Tenure	4.7 months		6.8 months			
Median Tenure	5 months		6.4 months			

SECTION 5

RESIDENT CHARACTERISTICS

The characteristics of Summit Plaza residents are presented in terms of three factors: retirement status, number of adults, and number of children. Other types of demographic data were not collected in this survey.

5.1 Retirement Status of Household Heads

Thirty-nine of the 164 household heads report that they are retired. All of the retired respondents live in multi-family medium-rise or high-rise units. Their tenure ranges from less than 3 to 12 months with the vast majority (31 out of 39) in residence at this site from 4 to 9 months.

5.2 Number of Adults and Children

For the 164 units, population data are specifically categorized by the number of adult and child residents per unit as follows:

- Adults
  - .. 1
  - .. 2
  - .. 3
  - .. 4 or more
- Children
  - .. 0
  - .. 1
  - .. 2
  - .. 3
  - .. 4 or more

Use of this type of categorization limits the precision of population data to minimum numbers of adults and children. The specific number of persons living in the 164 sampled units was not determined. It was determined, however, that at least 164 adults and 66 children reside in the sampled units and that 4 such units contain 4 or more adults and 2 units contain 4 or more children. Ninety-eight units have no children. Specific population data by housing type are discussed below.

5.2.1 Adults and Children in Multi-Family Units

All of the housing units at this site are contained within multi-family structures. Fourteen persons live in the sampled MFLR units. Of that number 10 are adults. The remaining 160 sampled units are MFMR and MFHR. At least 407 people reside in these units, of which 303 are adults and 104 are children.

The population of adults and children in both MFLR and MFH/MR units, the number of adults and children per unit data, and totals for all multi-family housing are displayed in Figures 3 and 4.

Number of Adults Per Unit	Multi-Family Low-Rise					
	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	2	0	0
1	1	1	1	0	0	1
2	0	0	2	2	4	4
3	3	9	3	0	0	9
4 or more	0	0	4 or more	0	0	0
Total	4	10	Total	4	4	14

FIGURE 3: POPULATION OF MULTI-FAMILY LOW-RISE UNITS

Number of Adults Per Unit	Multi-Family High-Rise					
	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	96	0	0
1	34	34	1	36	36	70
2	113	226	2	18	36	262
3	9	27	3	8	24	51
4 or more	4	≥ 16	4 or more	2	≥ 8	≥ 24
Total	160	≥303	Total	160	≥104	≥407

FIGURE 4: POPULATION OF MULTI-FAMILY HIGH-RISE UNITS

SECTION 6

SUMMARY OF THE SITE MANAGERS' PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of site management's understanding of the extent of solid waste collection/disposal facilities and services, of expected resident practices in storing and disposing solid wastes, of regulations governing resident storage and disposal actions, of use of facilities and services, of limitations of services, and of charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and compaction of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilties. The discussion which follows presents the application of such facilities and services for each type of housing.

6.1.1 Multi-Family Low Rise Units

MFLR units have trash chutes on each floor. Trash deposited in these chutes are conveyed by pneumatic tube to a central compaction area. Trash is collected twice weekly from this site by a private contract hauler.

Yard maintenance and wastes created therefrom are disposed of by site management.

6.1.2 Multi-Family High Rise

The trash collection procedure for the MFHR units approximates that procedure used in the MFLR units.

6.2 Expected Resident Storage and Disposal Practices

Residents of the multi-family units at this site are expected to use the pneumatic chutes located on each floor for the removal of regular wastes. Site management is available to supply removal services for bulky wastes inappropriate to disposal by means of the trash chute.

6.3 Site Rules and Regulations

A list of site rules and regulations was prepared by Summit Plaza Management on December 21, 1974, some 40 days prior to our survey (see next page, Figure 5). These rules were prepared to prevent major trash and waste back-ups in the trash chute and closet areas during the Christmas Season.

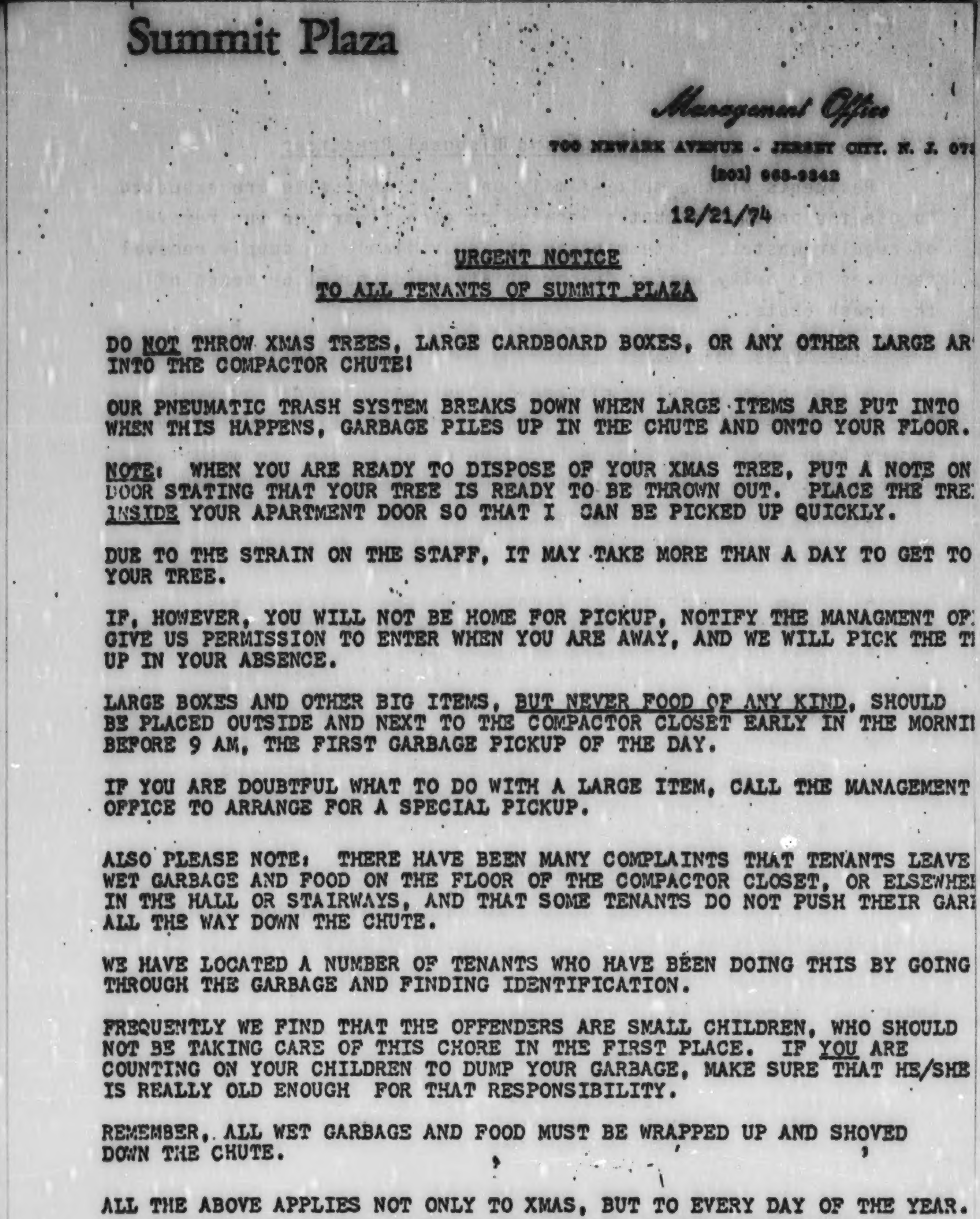
The rules are provided to:

- Make provisions for disposal of large bulky wastes, principally cardboard boxes and Christmas Trees
- Instruct residents about the limitations of the trash chute - pneumatic tube disposal system, and specifically to caution them to avoid actions which cause chute back-ups and trash room overloads
- Advising residents of the degree of cooperation required to prevent the trash rooms from becoming unclean and unhealthy facilities due to careless deposit of wet garbage and trash in chute areas and also a variety of places around the site.

6.4 Limitations on Disposal Volume and Service Charges

There is no limitation on the amount or kind of household trash or bulky waste which can be disposed of through the system.

The costs of trash removal are borne by the residents indirectly through their rental payments.



Summit Plaza

Management Office

700 NEWARK AVENUE - JERSEY CITY, N. J. 07
(201) 963-9342

12/21/74

URGENT NOTICE

TO ALL TENANTS OF SUMMIT PLAZA

DO NOT THROW XMAS TREES, LARGE CARDBOARD BOXES, OR ANY OTHER LARGE AR
INTO THE COMPACTOR CHUTE!

OUR PNEUMATIC TRASH SYSTEM BREAKS DOWN WHEN LARGE ITEMS ARE PUT INTO
WHEN THIS HAPPENS, GARBAGE PILES UP IN THE CHUTE AND ONTO YOUR FLOOR.

NOTE: WHEN YOU ARE READY TO DISPOSE OF YOUR XMAS TREE, PUT A NOTE ON
DOOR STATING THAT YOUR TREE IS READY TO BE THROWN OUT. PLACE THE TRE
INSIDE YOUR APARTMENT DOOR SO THAT I CAN BE PICKED UP QUICKLY.

DUE TO THE STRAIN ON THE STAFF, IT MAY TAKE MORE THAN A DAY TO GET TO YOUR TREE.

IF, HOWEVER, YOU WILL NOT BE HOME FOR PICKUP, NOTIFY THE MANAGMENT OF
GIVE US PERMISSION TO ENTER WHEN YOU ARE AWAY, AND WE WILL PICK THE T
UP IN YOUR ABSENCE.

LARGE BOXES AND OTHER BIG ITEMS, BUT NEVER FOOD OF ANY KIND, SHOULD
BE PLACED OUTSIDE AND NEXT TO THE COMPACTOR CLOSET EARLY IN THE MORNI
BEFORE 9 AM, THE FIRST GARBAGE PICKUP OF THE DAY.

IF YOU ARE DOUBTFUL WHAT TO DO WITH A LARGE ITEM, CALL THE MANAGEMENT OFFICE TO ARRANGE FOR A SPECIAL PICKUP.

ALSO PLEASE NOTE: THERE HAVE BEEN MANY COMPLAINTS THAT TENANTS LEAVE
WET GARBAGE AND FOOD ON THE FLOOR OF THE COMPACTOR CLOSET, OR ELSEWHE
IN THE HALL OR STAIRWAYS, AND THAT SOME TENANTS DO NOT PUSH THEIR GAR
ALL THE WAY DOWN THE CHUTE.

WE HAVE LOCATED A NUMBER OF TENANTS WHO HAVE BEEN DOING THIS BY GOING THROUGH THE GARBAGE AND FINDING IDENTIFICATION.

FREQUENTLY WE FIND THAT THE OFFENDERS ARE SMALL CHILDREN, WHO SHOULD NOT BE TAKING CARE OF THIS CHORE IN THE FIRST PLACE. IF YOU ARE COUNTING ON YOUR CHILDREN TO DUMP YOUR GARBAGE, MAKE SURE THAT HE/SHE IS REALLY OLD ENOUGH FOR THAT RESPONSIBILITY.

REMEMBER, ALL WET GARBAGE AND FOOD MUST BE WRAPPED UP AND SHOVED DOWN THE CHUTE.

ALL THE ABOVE APPLIES NOT ONLY TO XMAS, BUT TO EVERY DAY OF THE YEAR.
CONSISTENT CARE IN THE DISPOSAL OF GARBAGE IS THE MOST BASIC AND ESSENTIAL ITEM ON OUR MAINTENANCE AGENDA.

FIGURE 5: SITE MANAGERS RULES

SECTION 7

RESIDENTS' SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains all the data describing the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- Location of disposal site

7.1 Disposal of Bulky Wastes

The principal issues regarding bulky waste disposal and collection practices are presented here. These issues include:

- Site management or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for larga and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

The specific rules and regulations promulgated by site management for resident disposal of bulky wastes include specific provisions for:

- Placement of large cardboard boxes or other large articles outside and next to the compactor closet early in the morning, prior to trash pick-up which starts at 9:00 A.M.

- Notifying site management of the need for assistance or to arrange special pick-up in moving large bulky waste to collection points
- Removing Christmas trees after the holiday season, by placing a note on the door notifying site maintenance personnel to remove the article from the inside of the apartment, where it is to be placed until it can be removed.

7.1.2 Placement of Large and Small Bulky Wastes

Small bulky wastes include small appliances and bulky cardboard items. Large bulky wastes include such items as furniture and discarded major appliances.

Of the 164 respondents at this site, 65 percent (106) indicate that they separate small items from their regular trash while 90 percent (147) say they separate large items out of their regular household trash.

7.1.3 Responsibility for Bulky Waste Collection

The residents of this site rely upon site management for the collection of small (156 out of 164) and large (157 out of 164) bulky items. Site management provides a contracted private hauler for the removal of wastes, and the respondents are aware of site management as the provider of collection services. Figure 6, below, presents data on respondent understanding of bulky waste removal responsibility.

	Small Items	Large Items
Local Government	0	0
Management	156	157
Taken to Dump	5	3
Private Collection Service	0	1
Don't Know	3	3
Total	164	164

FIGURE 6 : RESPONDENT UNDERSTANDING OF BULKY WASTE DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

Bulky wastes are disposed by collection in the regular trash pick-up, by collection by "special" pick-up, and by pick-up requested by the resident.

The majority (87 out of 164) of the respondents indicates that the collection of small bulky waste is at the request of the resident. Eighty-seven percent (142 out of 164) of the respondents have small bulky items collected at the regular trash pick-up and 7 percent (11 out of 164) dispose of large bulky items with the regular trash collection. Five percent (9 out of 164) of the respondents do not know how to get small bulky wastes collected, and 6 percent (10 out of 164) do not know how to get large bulky wastes collected.

7.2 Separation of Wastes

There are no site rules which require residents to separate glass, plastics, newspapers, food wastes and other items before collection. Residents are required to separate large bulky waste items and refrain from placing such large wastes down the trash chutes. Most respondents, 90 percent, separate large bulky wastes from other trash; although, curiously, only 49 percent (81 of 164) are aware that they are required to do so. Further, most respondents, 66 percent, believe that they are required to separate such household wastes as glass, plastics, newspapers and magazines, although they are not required to do so.

Figure 7 which follows presents the respondents' perception about which types of trash they believe they are required to separate.

Resident Action and Items	Percentage of Residents	Number of Cases
Separate Household Trash Items:		
Glass	59%	96
Bulky Wastes	49%	81
Plastics	16%	27
Food Wastes	0%	0
Newspapers and Magazines	55%	90
Other (cans)	<1%	1
Frequency of Trash Separation	66%	108
Frequency of Non-Separation	34%	56
TOTAL	100%	164

FIGURE 7: EXTENT OF RESIDENT TRASH SEPARATION

7.3 In-home Solid Waste Storage

The primary in-home solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined cans, trash compactor and other unspecified types.

Plastic trash bags are used by 40 percent (65) of the respondents, and grocery bags are used by 55 percent (91) of the sample. Four percent (7) used unlined cans. Only one respondent reports the use of a compactor.

Types of wastes stored in these containers include paper and packaging (145 respondents), glass bottles (52), plastic items (78), cardboard items (61), newspapers (58), magazines (41), food wastes (163), and cans (1).

On the average, Summit Plaza residents fill their in-home waste storage capacity about four times per week (3.7 times for MFLR and 3.8 times for mid- and high-rise residents). Two adult homes fill their in-home containers daily (79 out of 164) more than any other group. Households with no children have a fairly high rate of daily in-home container fill-ups (62 out of 164) as do households with 1 child (25 out of 38).

7.4 External Solid Waste Disposal Practices

The practices for storage and disposal of solid wastes outside the home are related to the type of housing unit. For apartment dwellers, excess storage facilities are typically congregate in nature; thus, the external storage becomes a disposal function when the wastes are placed in the trash chutes. In effect, the shifting of solid waste storage responsibility from dweller to building manager becomes a disposal action in the viewpoint of the residents.

The vast majority (154 out of 164) place their wastes in a trash chute. Less than 2 percent (3 in each case) take their wastes to a trash room or central compactor. Ninety-five respondents report moving their trash less than 25 feet to the trash chute.

SECTION 8

RESIDENTS' UNDERSTANDING OF THEIR RESPONSIBILITIES, COSTS AND FREQUENCY OF SERVICES

This report section covers quantitative and qualitative data taken from interviews of site management personnel and from residents. The focus of the section is on establishing resident awareness of site management policy and arrangements regarding responsibility for providing solid waste collection services, payments for such services, and their frequency of occurrence.

8.1 Responsibility for Solid Waste Collection

8.1.1 Household Trash

The management respondent at this site states that the collection of household trash for all types of dwelling units is a service provided by site management through a private contract hauler. Resident awareness of the provider of this service is high with 161 out of 164 respondents reporting that site management is responsible for the removal of trash. The remaining respondents do not know who provides the service.

8.1.2 Bulky Wastes, Including Yard Wastes

The property management respondent reports that yard maintenance for all dwellings at this site is the responsibility of management personnel; this maintenance responsiblity includes the removal of all yard wastes. The management respondent also indicates that special collection services may be requested and obtained by a resident's phone call to the management office. Resident awareness of this management responsibility is high as at least 95 percent (156 out of 164) rely on property management personnel for the removal of large and small bulky wastes.

8.2.1 Resident Awareness of Type of Charges

Two residents at this site report having paid fees for the removal of large bulky items. These are the only reported instances of a removal fee and neither respondent reports the amount he has been charged. Four respondents do not know if there is a charge for removing small bulky items. Eight do not know if there is a charge for removing large bulky items.

8.3 Frequency of Services - Resident vs. Management Perceptions

This section compares the understanding of management with that of residents with respect to the frequency of regular trash collection services.

Trash is collected twice a week at this site. Seventy-nine percent (129 out of 164) of the respondents find the waste storage facility adequate. Among those respondents reporting inadequacies, chute back-ups (23 mentions out of 36 problem mentions) is the most frequently voiced criticism of the removal system. The next major inadequacy reported is the small size of the trash chute closet (9 out of 36 mentions). Resident non-use (2 mentions), central compactor mechanical problems, and small size of the chute opening (1 mention each) are also complaints.

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

To assess the suitability of the system to the environment, respondents were asked for their opinions on unpleasant environmental effects such as noise, odors, trash spillage causing littering effects, pests (insects and vermin), nuisances caused by household pets, effects of weather causing flooding in trash storage areas, and littering. Their perceptions are presented below.

One respondent out of 164 finds the waste disposal system environmentally inadequate and does not state a reason for this inadequacy.

The largest concentration of complaints about the adequacy of the waste disposal system occurred in 2-adult households (27 out of 36 system-related complaints) and in childless homes (17 out of 36 complaints). These problem mentions come largely (25 out of 36 complaints) from respondents with 4- to 9-month tenure at this site.

SECTION 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystems. The principal components investigated were:

- trash compactors
- external storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- regularity of service (e.g., trash collections)
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

10.1 Resident Attitudes Toward Suitability of Facilities and Equipment

10.1.1 Trash Compactor

Only one trash compactor is in use at this site. Its user did not respond to any questions about the number of trash bags filled per week or nature and extent of problems encountered in its operation.

10.1.2 External Waste Disposal Facility - Apartments

The majority of high-rise respondents reports that their building's external waste storage capacity is adequate (128 mentions of no problems); however, only one respondent of a low-rise unit has similar feelings. The most frequently cited problem is that the trash chute backs up (23 mentions). Most of the complaining respondents attribute this inadequacy to chute door malfunctions (10 mentions) or the perception that the chute door opening is too small (5 mentions). One respondent notes that the chute door is difficult to keep open while disposing of trash. Site management attributes this problem to the observation that residents are not pushing their trash all the way down the chute.

Another group of respondents reports (9 mentions) that the trash room (compactor closet) is too small. Two others report that the other residents are not making proper use of the disposal chute system. This is in agreement with site management's complaint that a number of residents are leaving wet garbage and food wastes on the floor of the trash room (chute closet), in hallways or stairways. In nearly all cases, complaints are expressed by moderate to heavy users of the system; that is, households reporting that they fill 3 or more in-home containers per week. For example, 22 of the 23 respondents report filling their interior storage capacity daily or more than once per day. The same pattern holds for the 9 persons mentioning that the trash chute closet is too small--all 9 fill their interior trash storage capacities 3 or more times per week.

Tenure of residency is also a good indicator of resident dissatisfaction with the adequacy of the system. Although the greatest majority of survey respondents have lived at Summit Plaza for less than one year, most complaints are expressed by respondents with longest tenure. Of 64 residents with seven to nine months, 11 report problems with chute door operation, which are mainly caused by trash back-up. Of 68 residents with four to six months tenure, 11 report chute door problems primarily related to trash back-ups.

Overall, the major dissatisfaction of Summit Plaza residents centers on the failure of the trash chute to operate easily and properly. Based on respondent comments and the observations of Summit Plaza management, the major cause of chute door malfunctions is apparently the failure of residents to push the trash all the way down the chute. Regarding the complaint that the compactor closet is too small, the respondents with this complaint are reacting primarily to the excess waste left in the room by other residents failing to use the trash chute or those who are unable to operate the chute door because of trash back-ups. Despite these problems, there are no resident complaints about odors, insects, pet nuisance or vermin.

10.2 Attitudes About the Movement of Wastes to Disposal/Collection Point

The four MFLR residents included in the survey move their household trash approximately 45 feet (Median Statistic, 60 feet average) to the trash closet. Residents of the high-rise and mid-rise apartments report their trash is moved approximately 20 to 28 feet (median of 19.6 feet, average of 27.5 feet). Distances range from 10 feet or less to more than 100 feet, with the greatest number of mentions (107 out of 160 mid/high-rise respondents) falling in the 10 to 50-foot range.

Potential danger in moving wastes to the trash chute generally is not a problem. Some 96 percent (157 out of 164) residents report they encounter no danger; however, seven high- and mid-rise apartment residents report that they have experienced or fear criminal assault while moving their trash to the trash chute closets. Two of these seven residents are retired. All seven are moderate to heavy users of the system: they fill their in-home trash storage capacity 3 or more times per week. Six of the seven complaining respondents represent households with 2 adults. Three of the complaining respondents have no children, two have 1 child and the other two have 2 children. All the complaining residents have lived at Summit Plaza for less than one year with only one reporting tenure of three months or less. Apparently, the incidence of criminal assault is a real problem to a small set of residents in the high- and mid-rise buildings. It affects two-adult households with none or less than 3 children. This criminal assault problem should be investigated more thoroughly by Summit Plaza management.

10.3 Attitudes About Problem Resolution

Respondents were asked who they would contact in the event they encountered a trash disposal or collection related problem. Three respondents do not know that site management should be contacted to resolve problems. This is high level of awareness, 161 of 164 residents, and indicates good communication of Summit Plaza management with residents.

Management responsiveness to actual complaints appears to be good. Thirty-three respondents (2 MFLR and 31 MFM/HR) mentioned that management resolved problems which they reported. Only 2 residents, both MFM/HR, report that management had not resolved their problems. Seventy-nine percent (129 of 164) of Summit Plaza residents report that they had not experienced problems.

Overall, most residents with problems have had their problems satisfactorily resolved by site management.

10.4 Resident Attitudes About the Cost of Collection

The residents do not pay directly for the cost of trash collection. Almost all (157 of 164) respondents know that they do not pay for such services directly. Only seven respondents, all MFM/HR dwellers, do not know that trash collection charges are included in their rent payment.

Evidently, a small number of respondents have some idea about what portion of their rent is allocated to trash charges, although none know the exact amount. These four residents, all mid- and high-rise dwellers with 4 to 9 months of tenure, feel that trash collection costs are "about right," relative to the frequency and quality of services.

10.5 Resident Awareness of Service Providers and Innovations

Most respondents are not aware of the fact that a private contractor is picking up the site's aggregate compacted trash at the central compactor. This is very understandable since most residents do not have need or occasion to go down to the central compactor. Their last interest is in placing the trash down the chute. Since site management cleans the trash rooms (trash chute closets), residents are somewhat correct in assuming (as 161 of 164 residents did) that site management is responsible for collection of regular wastes. This high rate of awareness of responsibility for trash removal correlates well with resident perceptions about where they should take their complaints.

Summit Plaza residents are, to some limited extent, aware of innovative solid waste disposal techniques and equipment used at the site. Fifteen percent (24 of 164) of the respondents, all mid-rise and high-rise dwellers, are aware of some kind of innovation. Seventeen state that they are aware of the central compactor system, six are aware of trash chutes as innovations, and one respondent is unaware of any specific innovations. Respondents with such awareness are moderate to heavy users of the system, that is, they fill their in-home capacity three or more times per week, 22 or 24 cases; and most (22 of 24 cases) have resided at the site from four to nine months.

Respondents were asked if they are aware of the trash collection system innovations on the site. If they answered yes, they were then asked what innovations are used. No prompting or extensive probing of respondents was attempted.

2

INDIANAPOLIS, INDIANA

SECTION 1

CONCLUSIONS

The analysis of the data collected from the site manager and residents of Park Lafayette, resulted in conclusions on management and resident perceptions and attitudes on the following issues:

- Adequacy of trash storage and collection facilities and services
- Trash and bulky waste storage requirements and practices of residents
- Resident awareness of, and opinions about, solid waste disposal system operations, costs, and their responsibilities and point of interaction for resolving problems
- Suitability of the system to the environment.

1.1 Conclusions About the Site Management's Attitudes and Impressions

At the time of the site manager interview, January 1975, Park Lafayette's site management personnel were relatively pleased with the solid waste disposal system. Management personnel had no complaints to report nor did they recall having received any complaints about any aspect of the system from residents. From the site manager's perspective, the facilities and services which comprise the site's solid waste collection and disposal system adequately meet the demands of the residents. Moreover, site management gave no indication that the cost of the system was high, nor did they indicate that the system was unsuited to the site's environment.

1.2 Conclusions About the Residents' Requirements, Attitudes, and Opinions

Single-family homes generate more trash and bulky waste than do residents of the multi-family housing, primarily due to the larger number of persons living in each residence. Single-family dwellers have more occasion to use the system, and as a whole, are more aware of its limitations and problems than residents of the multi-family housing, particularly residents of the medium-rise apartments.

In general, most of the site's residents feel that the system is adequate for their needs. Most of the residents simply require a clean and efficient method to dispose of paper and packaging, glass bottles, plastic items, and cardboard. About half of those surveyed also generate a substantial amount of waste newspapers, magazines, food, and cans. Wastes are stored inside the housing unit in a variety of container types with the most prevalent being plastic bags and grocery bags with or without cans. Average fill-up of the in-house storage capacity varies by housing type with single-family home dwellers filling their capacity about three times per week and multi-family dwellers about twice each week, reflecting effects of family size. One family owns and uses a trash compactor which permits this four-member family to reduce their storage container fill-ups to one per week; however, the family complains that the compactor malfunctions frequently.

Single-family dwellers store their excess trash in a variety of metal or plastic cans, some lined, some unlined, outside their home. When these outside storage cans reach their capacity, the single-family respondents move their trash, bagged in plastic, to the central trash storage area located nearest to their home. Single-family detached residents report that they fill an average of four external cans each week, and residents of attached single-family homes fill nearly three such containers each week.

Residents of low-rise buildings also use central trash disposal areas provided for such purposes. Mid-rise apartments dwellers all report using a trash chute, which feeds a standard roll-out container located in the basement.

Bulky waste disposal does not, for the most part, cause residents any problems, despite the fact that site management makes no specific provision for removal of such wastes. Residents claim that they separate large bulky wastes (e.g., furniture and appliances) from regular trash but do not separate small bulky wastes (e.g., cartons and small appliances). The removal of small bulky wastes does not cause residents problems, so long as such wastes are capable of being placed in the central collection area. Two mentions of cases occurred where the trash removal service did not take such wastes which were cartons, possibly large moving cartons, as both respondents had moved into their homes within the three-month period preceding our survey. The bulky waste removal issue could become a major problem for two reasons. One, site management neither makes specific provision nor promulgates any published rules for bulky waste removal. Second, most of the residents either do not know they are responsible for removal of such wastes (52 percent for small items, 32 percent for large items) or think that site management (nine percent for small items, five percent for large items) or the municipal collection agency (24 percent for small items, nine percent for large items) removes such wastes. At present, most collection of small bulky waste items is provided by the municipal trash collection agency. Some collection of large bulky wastes also seems to be provided by this agency. The problem if it were to occur, would primarily arise among apartment dwellers. In only one reported instance a resident was required to pay a small fee of $2.00 for special service to remove bulky wastes.

One important conclusion involves the lack of awareness of residents about the nature of service providers, the frequency of collection, and whom they should contact in the event of problems. Almost 60 percent of single-family residents and 77 percent of apartment dwellers do not know that their trash is collected by a municipal agency. Less than half of the single-family home residents know that the trash is collected once per week. Finally, the issue of problem resolution is also an area of resident misunderstanding. Although a municipal agency provides trash collection service, 88 percent of site residents feel that they should call the site manager to resolve problems. This is appropriate for medium-rise apartment dwellers who use trash chutes. It may also be a workable practice for other residents, as they are all renters and collections are not made from their homes, but from the central collection area. It would be useful, however, for the site manager to clarify the complaint procedure for trash collection problems.

Environmental problems are a matter of concern to single-family dwelling residents. Among apartment dwellers, approximately one-fourth (8 of 30) cite specific environmental effects, including weather effects causing flooding and littering, insects, odors, and pet nuisances. Weather effects are the greatest concern of low-rise unit dwellers, while insects and odors are cited primarily by medium-rise residents. Single family residents cite similar problems, but at a much higher level of occurrence. Specifically, they cite:

- Weather effects (28 mentions)
- Dog and cat nuisances (24 mentions)
- Insects (17 mentions)
- Vermin (14 mentions)
- Odors (9 mentions)

Each of these is a major deterrent to the effectiveness of the cnetral collection area as a clean and healthful mans of trash disposal.

In a related area, residents of single-family homes indicate problems with the adequacy of the central collection area's storage capacity. Eighty-four percent of the single-family respondents report that the area becomes overloaded weekly, with higher incidence of such reports in the attached homes than in the detached home areas. "Household trash" is the most frequently cited cause of overloading, followed by bulky items. The greatest number of "overloading" complaints are not from residents with the largest volume of household trash to dispose, (four or more external containers per week) but from residents with moderate trash disposal volume, (two to three external containers per week). Because site management presently places no limit on the amount of trash each resident can dispose of weekly, (some residents generate 10 to 28 containers per week at the site) overloading by these high volume trash generators may be limiting the adequacy of the system for the moderate users. The widespread overloading problem is the most serious issue, and aggravates the problems of vermin, insects, odors, dog nuisances, and trash spillage noted by the residents of the single-family and multi-family low-rise units. The lack of resident cooperation, mentioned by at least six respondents, contributes to the overloading problem.

Residents of the medium-rise apartments report that their major problem is back-ups of the trash chutes. There are four mentions of this problem from 21 medium-rise residents surveyed.

SECTION 2

RECOMMENDATIONS

Based on the conclusions reached, recommendations are warranted to:

- Clarify resident misunderstanding and lack of awareness about the use of the system, its costs and conveniences, and procedures for resolving complaints
- Overcome the problems of overloaded facilities and accompanying health hazards from insects, vermin, dog nuisance, and odor
- Correct the effects of weather such as flooding and trash spillage in central trash collection areas

Each of these are discussed below.

2.1 Clarification of Resident Misunderstandings and Lack of Awareness

Site management should establish a dialogue with Park Lafayette residents relating to trash and solid waste disposal. The dialogue would serve to clarify misunderstandings about system operations, use of collection areas, pickup days, and problem resolution. This dialogue would be an effective method for disseminating information about new rules to relieve the trash overloading and environmental effects being encountered at the site.

Site management should disseminate some information about the trash disposal innovations at the site. This should be followed up by information about trash pickup days, requirement to utilize plastic bags, costs of system operation and maintenance--in terms of the amount of the monthly rental fee allocated for such costs, procedures for removal of large and some small bulky wastes, and about common problems experienced by site residents and what can and will be done to resolve such problems.

2.2 Reducing the Problem of Overloaded Collection Areas and Related Environmental Impacts

Site management should monitor each of the trash disposal areas for specific incidence of overloading and resultant environmental effects. The remedy for this problem is somewhat complex as it relates to the amount of space available for adding storage capacity, as well as the impact of making such additions without altering the plans for dissipating the weather effects, principally flooding, in the central collection areas. Site management should have their maintenance personnel check each single family and multifamily low-rise collection area to determine:

- the frequency of overloading
- resident use of plastic bags to dispose of their trash
- the amount of large bulky waste items which are placed in or near the collection area
- the extent of littering, pet nuisance, odors, insects, and vermin
- the extent of resident cooperation in placing their trash in bags inside overloaded areas.

For each area with consistent evidence of suc h effects, site management should devise and implement a plan to add more storage space. After capacity of such collection areas has been increased, site management should continue to monitor each area to determine if the change has produced satisfactory results.

For areas where increased storage capacity is not possible and in areas where increased capacity does not reduce overloading, site mangement will need to either devise other means for increasing such capacity or consider placing limits on the number of bags that residents can dispose of in each area with instructions to residents to take excess bags to ancillary storage areas. Firm regulations for disposal of bulky wastes should be developed.

2.3 Eliminating Weather Effects

Careful study should be made of each area where there is consistent flooding and wind-related scattering of trash caused by inclement weather. For each area so affected, site management, working with engineers, should construct additional drainage facilities and windscreens.

SECTION 3

PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

3.1 Size and Location of Site

The Indianapolis Operation Breakthrough Site consists of 42.9 acres. The site is located three miles from Indianapolis' Central Business District. Driving time to the Central Business District is about 15 minutes.

3.2 Land Characteristics

The site is flat with few trees existing prior to its development. It was formerly a portion of a 120-acre State Mental Health Farm. The balance of the land parcel is included in an overall master site plan which was developed by the City of Indianapolis.

The site is bound in the South and East by existing single-family detached homes.

3.3 Description of Site Layout

The site contains 295 units of varied medium and low density building types which are single-family attached and single family detached residences and multi-family medium-rise and low-rise structures. The overall density of the site is 9.4 units per acre. Site density has been varied to provide a communal blending of existing single-family detached homes adjacent to the site and the higher density buildings located at its core. Density progresses from single-family detached homes at its periphery to single-family attached, then to multi-family low-rise and finally to multi-family medium-rise residences.

The cluster planning approach was used to separate vehicular and pedestrian circulation. Parking was planned at two cars per unit. Creative mass grading was used for environmental interest and separation, both physically and visually, between pedestrian and moving and parking vehicle areas. The sculptured land forms which were created relieve the otherwise monotonous character of this flat site.

Open space is aggregated and used for communal purposes and to provide green ways between clusters and housing units. To promote greater open space, a zero-lot line concept was used to plan single family detached lots. This has the effect of reducing side and front yards, while providing for large common open greens.

To alleviate the overcrowded schools and lack of community parks, identified as problems by residents of the surrounding community, the site planners incorporated a 10 acre city park and proposed Middle School into the site. These facilities will serve the residents of both the Breakthrough site and the surrounding community.

3.4 Special Environmental Considerations

To overcome the effects of heavy rain and flash flooding, common to the area, a system of contoured basins has been created. The system is designed to contain excess water in restricted open spaces until the water percolates back into the soil or drains into the storm sewer system.

SECTION 4

CHARACTERISTICS OF SITE HOUSING

In this section a discussion of the characteristics of site housing is presented. The focus is on amount and type of housing rather than on the physical and/or architectural housing characteristics. The extent and length of occupancy and housing costs are also discussed here.

4.1 Types and Numbers of Housing Units

There are four different types of housing units at the site. These are single-family attached (SFA), single-family detached (SFD), multi-family low rise (MFLR) which are four stories or less, and multi-family medium rise (MFMR) which are 5 or more stories.

The largest group is SFA with 140 units. These have 2, 3 or 4 bedrooms. Next in size are the SFD units which number 103. These have 3 or 4 bedrooms.

The multi-family units are much smaller in number. There are 16 MFLR units which are either 2 or 3 bedroom types, as well as 36 MFMR units which are either 1 or 2 bedroom types.

In total there are 295 units. Of these, 153 are included in our sample for the resident survey. All data which are presented are derived from our sample which is stratified by housing type as follows:

- Single family detached - 46 units
- Single family attached - 77 units
- Multi-family low rise - 9 units
- Multi-family medium rise - 21 units

4.2 Ownership and Occupancy

The site manager was interviewed in January 22, 1975. The site manager reported that SFA, MFLR and MFMR were fully occupied at a level of 99 percent occupancy. Single family detached homes were 80 percent occupied. The site manager was not sure what level of occupancy represented "full occupancy" for the SFD units, nor was he sure when SFD units would be fully occupied.

All of the site housing is presently owned by Adult Student Housing, Inc., and Park Lafayette, a limited partnership. All of the occupied units are being rented. The rental range for each type of housing is shown below in Figure 1.

Housing Type	Number of Bedrooms	Monthly Rental Range
SFA	2 to 4	$135 to $190
SFD	3 to 4	$222 to $320
MFLR	2 to 3	$132.50 to $164.50
MFMR	1 to 2	$137.50 to $162.50

FIGURE 1: RENTAL RANGES BY HOUSING TYPE

The length of occupancy (tenure) is an important characteristic to note, as it provides a baseline of resident experience against which to measure attitudes and perceptions about the site and its solid waste disposal system. Tenure ranges from less than 3 months to more than 18 months across the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	Dwelling Type								No. and % by tenure	
	SFD		SFA		MFLR		MFHR			
	No.	%	No.	%	No.	%	No.	%	Total	%
Less than 3	5	11	10	13	2	22	5	24	22	14
4 to 6	7	15	15	19	1	11	4	19	27	18
7 to 9	12	26	11	14	0	0	2	10	25	16
10 to 12	6	13	9	12	1	11	3	14	19	12
13 to 18	4	9	5	7	1	11	3	14	13	9
More than 18	12	26	27	35	4	45	4	19	47	31
Total	46	100%	77	100%	9	100%	21	100%	153	100%
Average Tenure	11.5 months		12.5 months		15.9 months		10 months			
Median Tenure	9.3 months		10.3 months		13 months		9 months			

FIGURE 2: TENURE OF RESIDENTS BY DWELLING TYPE

SECTION 5

RESIDENT CHARACTERISTICS

This section presents the characteristics of Park Lafayette residents in terms of retirement status, number of adults and number of children. Other types of demographic data were not collected in this survey.

5.1 Retirement Status of Household Heads

Only one of the 153 household heads reported that he is retired. This individual lives in a multi-family medium rise unit and at the time of the survey had lived there for less than three months.

5.2 Number of Adults and Children

For the 153 units surveyed, population data was collected on adults and children which categorized the number of residents per unit in this manner:

- Adults
  - 1
  - 2
  - 3
  - 4 or more
- Children
  - 0
  - 1
  - 2
  - 3
  - 4 or more

Use of this type of categorization usually limits the precision of population data to minimum numbers of adults and children. At least 351 adults and 119 children reside in the sampled units; 24 units contain 4 or more adults and 9 units contain 4 or more children. Ninety-six units have no children. Specific Population data by housing type are discussed below.

5.2.1 Adults and Children in Single Family Detached Homes

At least 109 adults and 78 children, a total of at least 187 persons reside in the 46 single family detached units included in our sample. SFD Units reporting 4 or more adults number 11, and those units reporting 4 or more children number.

There are 11 SFD Units which report no children. Figure 3, below, presents the adult and children populations of SFD Units.

Number of Adults Per Unit	ADULTS		Number of Children Per Unit	CHILDREN		Total Number o Persons
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	11	0	0
1	0	0	1	11	11	11
2	35	70	2	11	22	92
3	5	15	3	7	21	36
4 or more	6	≥24	4 or more	6	≥24	≥48
Total	46	≥109	Total	46	≥78	≥187

FIGURE 3: POPULATION OF SFD UNITS

5.2.2 Adults and Children in Single Family Attached Homes

A total of at least 232 persons reside in the 77 single family attached homes sampled. Of these, 193 are adults and 39 are children. Thirteen respondents report that four or more adults live in their units and three respondents indicate that 4 or more children reside with them. Figure 4, below, presents data on the adult and children population of SFA homes.

	ADULTS			CHILDREN		
Number of Adults Per Unit	Number of Units	Number of Adults	Number of Children Per Unit	Number of Units	Number of Children	Total Number of Persons
0	--	--	0	57	0	0
1	5	5	1	9	9	14
2	41	82	2	6	12	94
3	18	54	3	2	6	60
4 or more	13	≧52	4 or more	3	≧12	≧64
Total	77	≧193	Total	77	≧39	≧232

FIGURE 4: POPULATION OF SFA UNITS

5.3.3 Adults and Children in Multi-Family Units

Exact population responses are available for all 30 multi-family units surveyed, as no respondent indicates more than four adults or children reside in his apartment. Fifty-one persons live in the sampled multi-family units with 21 residing in the nine low rise units and 30 in the twenty-one medium rise units. Of these, all but two are adults. The two children reside in the low-rise units in two different families. Significantly, 12 of the MFMR residents are single heads of household.

Figure 5, below, displays the population of adults and children in both MFLR and MFMR Units.

	Multi-Family Low-Rise					
	ADULTS			CHILDREN		
Number of Adults Per Unit	Number of Units	Number of Adults	Number of Children Per Unit	Number of Units	Number of Children	Total Number of Persons
0	--	--	0	7	0	0
1	0	0	1	2	2	2
2	8	16	2	0	0	16
3	1	3	3	0	0	3
4 or more	0	0	4 or more	0	0	0
Total	9	19	Total	9	2	21

FIGURE 5: POPULATION MULTI-FAMILY LOW-RISE UNITS

	Multi-Family Medium-Rise					
	ADULTS			CHILDREN		
Number of Adults Per Unit	Number of Units	Number of Adults	Number of Children Per Unit	Number of Units	Number of Children	Total Number of Persons
0	--	--	0	21	0	0
1	12	12	1	0	0	12
2	9	18	2	0	0	18
3	0	0	3	0	0	0
4 or more	0	0	4 or more	0	0	0
Total	21	30	Total	21	0	30

FIGURE 6: POPULATION MULTI-FAMILY MEDIUM-RISE UNITS

SECTION 6

SUMMARY OF THE SITE MANAGER'S PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of the site manager's understanding of the extent of solid waste disposal/collection facilities and services, management's expectations of resident practices in storing and disposing solid wastes, regulations governing resident storage and disposal actions and use of facilities and services and limitations and charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and compaction of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilities. The discussion which follows presents the application of such facilities and services for each type of housing.

6.1.1 Single-Family Homes

SFD and SFA residents are expected to provide and maintain their own internal and external storage cans. For pickup by the city, residents are expected to move their wastes to outdoor central collection bins which are located throughout the site. These areas are either 8' by 8', 12' by 12' or 16' by 16', and number from two to six per SFD and SFA area. Each area is enclosed by wooden partitions and has a door for entry and exit.

Once each week, the municipal government-operated trash collection service empties these central collection areas. Site Management cleans, disinfects, and maintains the collection areas periodically.

Yard wastes such as grass clippings and leaves are collected by site management in the routine performance of yard maintenance service.

6.1.2 Multi-Family Low-Rise Units

MFLR units are provided with outdoor central collection areas of the same size and proportionate number as those provided to single-family dwellings. Trash is collected once each week by the municipal government.

Yard maintenance and wastes created therefrom are disposed of by site management.

6.1.3 Multi-Family Medium-Rise Units

MFMR units are provided with collection facilities which are significantly different from other site housing. Each floor of the building is provided with a charging station which is connected with a trash room in the basement. Trash deposited by residents is received by a standard roll-out container. Pick-ups are provided once per week by municipal government agency.

6.2 Site Managers' Expectation of Resident Storage and Disposal Practices

Residents of single-family homes and MFLR units are expected to move and place all their trash into the outdoor central collection areas located throughout the site. MFMR residents are expected to use the trash chutes located in their building. In addition, residents of these two dwelling types are expected to use plastic trash bags to reduce odor and trash spillage. Site management does not require residents to separate trash. Yard wastes are collected and removed by the site management.

Site management has made no specific provision for the removal of large or small bulky wastes. If residents are unable to deposit bulky wastes in the area and/or the municipal waste collection service refuses to take such waste, then it is the residents responsibility to arrange for disposal of such wastes.

6.3 Site Rules and Regulations

At the time of the survey, the site management had not prepared or published any rules governing the operation of the solid waste disposal system. The only apparent regulation is the requirement that residents use plastic trash bags to dispose of trash into the outdoor central collection areas.

6.4 Limitations on Disposal Volume and Service Charges

Simply stated, there are no limitations on the amount of household trash which a single-family or multi-family resident can dispose of during any specific period. There is no specific provision or limitation on the amount or kind of bulky waste which can be disposed.

The cost of the trash collection services provided by the municipal government are borne by site management. Since management does not provide special pick-up service on bulky waste items, there are no specific charges for such service.

SECTION 7

RESIDENTS' SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains describes the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- External solid waste storage practices (single family houses)
- Location of disposal site (Apartments)

7.1 Disposal of Bulky Wastes

The principal features of bulky waste disposal and collection practices will be presented here. These features include:

- Site management or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for large and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

There are no site management or trash disposal service rules or regulations governing the disposal and collection of bulky waste at Park Lafayette.

7.1.2 Placement of Large and Small Bulky Wastes

The small bulky waste type includes yard waste, small appliance and bulky cardboard items. The large bulky waste category includes such items as furniture and non-working major appliances.

Of the 153 respondents interviewed at the site, 93 percent (142) indicate that they separate large items from their regular trash, while only 39 percent (59) separate small items out of their regular household trash.

Forty-eight percent (21) of the single family, detached house residents interviewed separate small bulk items from their regular trash. Residents of single family attached houses, 2.6 percent (20) separate small items. Some 33 percent (3 of 9) and 36 percent (6 of 21), respectively, of low-rise and medium-rise apartment dwellers stated that it was their practice to separate small bulky waste from regular trash.

7.1.3 Responsibility for Bulky Waste Collection

Site management has made no specific provision for the removal of bulky waste items which the municipal trash collection agency refuses to collect. If the trash disposal service refuses to collect such items it is the responsibility of the individual resident to either contract a hauler or to take the items to the dump himself.

There is misunderstanding among the site residents concerning the responsibility for disposal of bulky wastes. For example, some 24 percent (36) think that the municipal trash service would remove small bulky wastes, and 9 percent think that the municipal agency would also remove large bulky wastes. Five percent of the respondents state that large items would be removed by site management. A much larger group of residents simply don't know (52 percent or 80 mentions for small items and 32 percent (48) for large items) what to do with such wastes. Only 54 percent (7 mentions) are aware that large items are to be hauled away by a private collector or taken to the dump by their own arrangement. Figure 6, below, presents these data on resident understanding of bulky waste removal responsibility.

	Small Items	Large Items
Local Government	24%	9%
Management	9	5
Taken to Dump	3	8
Private Collection Service	12	46
Don't Know	52	32
Total	100	100

FIGURE 7: RESIDENT UNDERSTANDING OF BULKY WASTE DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

The types of bulky waste disposal are: bulk waste collection included in the regular trash pick-up, collection by "special" pick-up, and pick-up requested by the homeowner.

Over 73 percent (90 of 123) of single family residents indicate that small bulky items are collected with their regular trash. A slightly smaller percentage - 67 percent (20 of 30) of apartment dwellers also indicate that small bulk items are collected with their regular trash. Lower percentages, 11 percent (17) and 3 percent (1) respectively for single-family and apartment residences, report that they had requested special pick up for small items.

The reverse is true for large bulky waste items, because of the problem in loading and hauling large items such as stoves and furniture. Only twelve (10 percent) of the 123 single-family residents state that large items are collected with the regular trash service, while twenty percent (6 of 30) of the apartment dwellers give the same response. Conversely, two-thirds (82 of 123) of the single-family residents and one-third (10 of 30) of the apartment dwellers indicate they call for special collection services.

Forty-three percent (13) of all apartment dwellers say they "don't know" how to have large bulk items removed. This percentage is much higher than the figure for single family residents (20 percent).

7.2 Separation of Waste

There are no site rules which require residents to separate bulky wastes, glass, plastics, newspapers, food wastes, or other items before collection. Bulky wastes are separated from the regular trash 39 percent (59 mentions) of the time in the instance of small items and 93 percent (142 mentions) of time for large items.

Figure 7, which follows, presents the frequency of waste separation in each trash category. Most residents (86 percent) do not separate their household trash.

Resident Action and Items	Percentage of Residents	Number of Cases
Separate Household Trash Items:		
Glass	2	3
Bulky Wastes	5	9
Plastics	0	0
Food Wastes	5	8
Newspapers and Magazines	2	3
Other	0	0
Frequency of Trash Separation	14	23
Frequency of Non-Separation	86	130
TOTAL	100%	153

FIGURE 8: EXTENT OF RESIDENT TRASH SEPARATION

7.3 In-home Solid Waste Storage

The primary in-house solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined cans, trash compactor and other unspecified types.

Plastic trash bags are used by 66 percent (102) of the respondents while grocery bags are used by 32 percent (48) of the sample. Less than 2 percent (3) of the respondents indicate that they use either a compactor, unlined can or other form of in-house container. Only one household has a trash compactor.

Residents report that they store the following items in their in-house containers: paper and packaging, glass bottles, plastic items, cardboard, newspapers, food wastes, and miscellaneous items such as disposable diapers and cans.

The following Figure 8 presents the number and percentages of respondents who report the types of waste stored in their in-house containers.

Type of Waste	No. of Responses[1/]	% of Responses
Paper/Packaging	151	99%
Glass Bottles	125	82
Plastic Items	135	88
Cardboard	131	86
Newspapers	86	56
Magazines	71	46
Food Wastes	72	47
Other: Cans	64	42
Disposable Diapers	2	1

[1/] Out of a total of 153 Units surveyed

FIGURE 9: TYPE OF WASTES STORED IN IN-HOUSE CONTAINERS

As anticipated, residents of single family detached homes fill their in-house storage containers far more frequently than residents of other types of housing. Basically, this is because family sizes are larger in the SFD homes. Figure 9, below, presents the average frequency of filling in-house storage containers by housing type and the number and percent of residents in each housing type who fill their in-house capacity 3 or more times per week.

In-House Storage Fill-up Characteristics	HOUSING TYPE			
	SFD	SFA	MFLR	MFMR
Average number of fill-ups per week	3.3	2.6	2.2	2.3
Number and percent reporting three or more fill-ups per week	36 of 46 (78%)	44 of 77 (57%)	4 of 9 (44%)	6 of 21 (29%)
Number and percent reporting daily or more than daily fill-up	23 of 46 (50%)	18 of 77 (23%)	1 of 9 (11%)	4 of 21 (19%)

FIGURE 10: FREQUENCY OF FILL-UP IN HOME STORAGE CAPACITY, BY HOUSING TYPE

7.3.2 Use of Trash Compactors

Only one household in the sample reports the use of a trash compactor. This is a family of four (two adults and two children) living in a single family detached house. This household reports that they fill the compactor an average of once each week and that they are troubled by frequent breakdowns of the compactor.

7.4 External Solid Waste Disposal Practices

The practices for storage and disposal of solid wastes outside the home vary by the type of housing unit. For single family homes, solid wastes in excess of the in-home storage capacity must be placed outside the interior living space until the exterior container is filled. Then the trash is moved to a central collection area. The apartment dwellers face the same needs, however, the excess storage facilities are typically congregate in nature, and thus the external storage becomes a disposal function when the wastes are placed in a trash room, trash bin, or other storage facility. In effect, the shifting of solid waste storage responsibility from dweller to building manager is a disposal action for apartment residents. Thus, the major features of external storage are different for single-family home dwellers and apartment dwellers.

7.4.1 External Storage - Single-Family Residents

There are four types of external storage containers: metal cans, plastic cans, plastic bags, and compactor bags. Respondents use each of the types of containers except compactor bags. This is because they store trash in plastic bags and metal and plastic cans outside their house, and later take it to the central storage location, or, in many cases, take it directly to the central storage area without storing it outside the house.

Site rules require that trash be put in plastic bags.

Single-family residents in detached houses fill an average of four exterior containers per week, while those residents in attached houses use 2.74 containers weekly.

Some of the single-family residents take their trash to the central collection area when their external house containers are full. Others place their wastes in plastic bags and take them directly to the central trash areas. The residents state that there is no limitation on the volume of household wastes collected.

7.4.2 Disposal Site - Apartment Residents

All of the mid-rise apartment residents use the trash chutes located on each floor of the building in a trash room.

Thirteen percent (4) of the residents move their trash less than 25 feet to the chute, 13 percent (4) are within 50 feet, 30 percent (9) are less than 75 feet, and 10 percent (11) are 100 feet away. Apartment residents are required by the site management to bag their trash in plastic bags.

Low-rise apartment dwellers utilize central trash areas located near their buildings. About half of these respondents (4) move their trash 50-75 feet, and the other half (5) travels more than 100 feet.

SECTION 8

RESIDENTS' UNDERSTANDING OF THEIR RESPONSIBILITIES, COSTS AND FREQUENCY OF SERVICES

This report section covers quantitative and qualitative data taken from interviews of site management personnel and from residents. The focus of the section is on establishing resident awareness of site management policy and arrangements regarding responsibility for providing solid waste collection services, payments for such services and their frequency of occurrence.

8.1 Responsibility for Solid Waste Collection

8.1.1 Household Trash

The management respondent at this site states that the collection of household trash for all types of dwelling units is a service performed by local government. Resident awareness of the provider of collection services is mixed: of the 123 residents of single family dwellings who responded to our survey only 50 (41%) are aware of local government's role in trash collection. Over fifty-nine percent (59%) either do not know who provides the service (57 respondents) or think that management (16 respondents) is responsible for the collection of household trash. Awareness of the provider of trash collection services is even lower among residents of multiple family dwellings with only two of the thirty respondents reporting correctly that such service is a responsibility of local government. Seventy-seven percent (23) of these respondents are not aware that their household trash is collected by local government and five think that the service is provided by property management personnel.

The survey indicates no direct relationship between a resident's awareness of who collects his trash and the length of time that resident has resided in his particular dwelling. Although roughly half (13) of the 25 respondents who have occupied their present dwellings for seven to nine months are aware that household trash collection is the responsibility of local government, less than half (22) of the 47 residents who have lived at this site longer than 18 months respond correctly that local government is the source of trash collection services. Ten of the thirteen respondents who have lived at this site from 13 to 18 months either do not know (7) who collects their trash or think the collection is the responsibility of property management personnel (3). The level of awareness of the provider of this service is correspondingly low for each of the other categories of resident tenure.

Overall, the level of resident awareness of the service is low and generally does not increase with length of residence.

8.1.2 Bulky Wastes, Including Yard Wastes

The property management respondent reports that yard maintenance for all dwellings at this site is the responsibility of management personnel; this maintenance responsibility includes the removal of all yard wastes. The management respondent is not aware of any manner by which the residents may request or obtain special collection services. This indicates, and is supported by resident response, that the removal of small and large bulky waste items is the responsibility of each resident.

Of the 123 residents of single family dwellings who responded to our questionnaire, the local government collection service is thought to be available for the removal of small bulky items by 33 residents and 12 respondents think this service available for the removal of large bulky items. Although only 14 residents of single family homes cite a private collection service as a source of small bulky waste removal, 64 rely on these private collectors for removal of large bulky wastes. Almost half (61) of the 123 single family dwelling residents are unaware of any provider of removal service for small bulky items; 32 of these residents do not know a provider of removal service for large bulky items.

Nineteen of the multiple-family dwelling residents do not know how to have small bulky wastes collected, and 16 of these residents are unaware of a comparable service for large bulky wastes. The residents' awareness of sources of bulky waste removal services does not appreciably increase with tenure at this site.

Generally, though substantial numbers of the residents are unaware of providers of bulk waste removal, knowledgeable residents indicated awareness of a variety of sources for that service.

8.2 Resident Responsibilities for Payment of Service Charges

This section covers resident awareness of regular charges and special charges levied against them for trash collection and removal of yard wastes and bulky wastes. The text compares aggregate resident awareness levels with management perceptions discussed under Section 7.

8.2.1 Resident Awareness of Type of Charges

None of the 153 respondents at this site reports any charges for the collection of small bulky items, although 22 of those respondents state only that they do not know of any of these charges. Five of 153 residents report that there is a charge for the removal of large bulky waste items; 82 of the respondents do not know whether there is any charge for this service. The remaining 66 residents maintain that there is no charge for this service.

Only one removal fee (a one-time $2.00 charge) was reported for the removal of a large bulky waste item. With that single exception, no other charge is reported for the removal of small or large bulky waste.

One respondent does not know whether there is a charge for regular waste removal service, while the remaining 152 respondents report that the charge is not paid directly. No respondent reports any charge for the collection of additional containers.

Overall, the residents at this site are aware of the indirect nature of charges for waste removal; however, these charges prompted neither positive nor negative attitudinal responses.

8.3 Frequency of Services - Resident vs. Management Perceptions

This section compares management and residents perceptions about the frequency of regular trash collection services.

8.3.1 Single-Family Homes

Fifty-five of the 123 residents of single-family dwellings interviewed, report weekly trash collection. Twenty-nine respondents maintain that the frequency of trash collection ranges from twice to five times weekly. Thirty-nine respondents are unaware of the frequency of trash collection. The Site Manager states that trash collection at this site is weekly.

None of the residents of single-family homes states any limitation on the volume of household wastes collected.

Only nine of the respondents state that overloading of the external storage facility is never a problem, while 84 percent (103) report weekly overloading of that facility. Of those responses in which a type of waste as a cause of overloading is stated, household trash (15 mentions) is most frequently cited. Bulky items (7 mentions) is the only other type of waste cited as a cause of overloading.

8.3.2 Apartments

Trash is collected weekly at the multiple-family dwellings at this site. Of the 30 residents who responded to our survey, 20 find the facilities adequate. Chute back-ups is the most frequently mentioned trash collection problem (4 mentions), while problems of a lack of containers and insufficient trash room space each receive one mention.

Generally, the frequency of trash collection resulting in overloading is only a significant problem at the single-family residences.

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

The major environmental concerns to both management and the residents are odors, trash spillage causing littering effects, pets, and effects of weather causing flooding in trash storage areas, and littering. To assess the suitability of the system to the environment, residents were asked for their opinions on unpleasant environmental effects encountered in the use of the solid waste collection facilities and services. Their perceptions are presented below.

9.1 Environmental Impacts Perceived by Apartment Dwellers

About one-fourth (8) of the 30 apartment residents at this site who responded to our questionnaire report that their present form of waste disposal does not afford adequate protection from environmental concerns. Although resident responses indicate that dissatisfaction with the adequacy of the waste disposal system at this site is not a function of tenure, the responses do indicate a higher degree of dissatisfaction (31 percent vs. 15 percent) among low-rise residents than among medium-rise apartment dwellers.

Inadequate protection from the effects of weather is one of the most frequently mentioned (3 times) deficiencies of the multiple family units' disposal system; it should be noted that the system's vulnerability to weather is reported only by residents of the low-rise structures. A problem of equal magnitude (3 mentions) with effects on all apartment occupants is the waste disposal system's reported susceptability to insects. Odors (2 mentions) and inadequate protection of trash from dogs (1 mention) also posed problems to the medium-rise residents.

Twenty of the 30 multiple-family unit occupants at this site who responded to questions about the adequacy of waste disposal systems available to them report the system adequate.

The majority of complaints (5 out of 6 complaints) come from two adult families with no children; the remaining complainant is the lone occupant of an apartment. Complaints of inadequacies come primarily (4 out of 6 instances) from apartment dwellers who have lived at this site fewer than 6 months. Most of the complaints (4 instances) come from residents of the medium rise structure who experience frequent chute back ups. One medium rise resident feels that there are not enough containers available for his use. The single complaint about the system from the low-rise respondents (1 mention) is that the trash area is too small.

9.2 Environmental Impacts Perceived by Single-Family Home Dwellers

Approximately twice as many residents of single family dwellings voice dissatisfaction with their waste disposal system as do occupants of multiple family dwellings. About 40 percent of the residents of single family units feel that their waste disposal system is inadequate. Further, their responses indicate that dissatisfaction with the disposal system increases with tenure at the site.

More residents of attached single family units report inadequate disposal system (43 percent) than residents of detached units (36 percent). Expressions that the facilities are inadequate are fairly well distributed throughout most of the varied housing arrangements of adults and children. However, residents who fill four or more storage cans per week (75 percent) find that the storage facilities are adequate. The strongest link between expressions of inadequate facilities and volume of trash appears for families which fill two or three storage cans weekly.

As do multiple family unit occupants, respondents from single family homes cite vulnerability to the effects of weather as the greatest deficiency in the waste disposal system (28 mentions).

The systems' susceptibility to dogs is the next major problem cited (24 mentions). Insects (17 mentions), vermin (14 mentions), and odors (9 mentions) also plagued the system's operations.

The major reason given (32 mentions) for those problems with the disposal system is the inadequacy of the outdoor central collection area (particularly for residents of attached homes who cited storage area inadequacies at a rate three times greater than that of detached unit residents). Lack of resident cooperation, the second major cause of the system's problems according to resident responses, plagues residents of attached structures equally (6 mentions in each structural category). Storage area inadequacy is of concern to two adult households with no children, and concerns one-third of those respondents who generate two or three storage containers of trash each week.

Eighty-four percent of the respondents report weekly overloading of their external storage facility. Although overloading tends to diminish somewhat with tenure, 57 percent of the respondents who have lived at this site longer than 18 months report weekly overloading. The problem of weekly overloading is reported with greater frequency (87 percent) by residents of attached homes than by residents of detached dwellings (78 percent). It is of some interest that only 7 percent of the respondents report that overloading is never a problem. The highest rate of weekly overloading (68 percent) occurs in units with two adults and also with childless homes (64 percent). This problem is also greatest (91 percent) among units filling two storage cans weekly. Household trash (15 mentions) is the leading contributor to external storage facility overloading followed by bulky items (7 mentions).

Only 14 complaints are reported by the single family housing residents. Spilled trash is the major complaint (10 mentions) followed by uncollected items (mentioned twice). These complaints are voiced predominantly (11 mentions) by respondents from two adult families and are experienced by households with either one or no child present (5 mentions each). The problems and experienced, to no great degree, by residents of homes generating less than one or more than four storage cans of trash weekly. Almost half of the complaints (five) are voiced by residents who had lived at this site longer than 18 months.

9.3 Summary of Environmental Impacts Caused by Systematic Inadequacies

Generally, environmental concerns are adequately met by the facilities available to residents of multiple family dwellings, while residents of single family units find greater inadequacy in their systems of trash disposal. Lack of protection of trash from the effects of weather is the most frequently expressed deficiency of disposal facilities at both single and multiple family dwellings.

Overloading is of particular consequence to residents of single family dwellings and is not affected by length of residence. Generally, however, the trash collection system at this site is viewed favorably by the residents.

Section 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystems. The principal components investigated were:

- trash compactors
- External storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- regularity of service (e.g., trash collections)
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

10.1 Resident Attitudes Toward Suitability of Facilities and Equipment

10.1.1 Trash Compactor

Only one trash compactor is in use at this site. The user lives in a single family detached unit. The respondent fills 1-2 bags each week. The respondent has lived at this site between 7 and 9 months. Two adults and two children live in the house where the compactor is in use. Frequent breakdowns with this equipment causes the owner of the in-home compactor some degree of non-use.

In summary, the use of trash compactors is insignificant at this site.

10.1.2 External Waste Storage Facility-Single Family Homes

Some 84 percent (103) of the 123 residents of single family homes report weekly overloading of the external storage facility. Only 7 percent (9) of these residents state that overloading is never a problem. One hundred and twenty (120) single family residents responded to questions about the effectiveness of waste storage containers. Of this number, 40 percent (48) report that the waste storage containers are inadequate. Residents' problems with inadequate storage containers increase with tenure at this site. Twenty percent of the residents who have lived at this site for fewer than 3 months (3 out of 5) report inadequate storage containers. Forty five percent (17 out of 38) of the residents who have lived at this site longer than 18 months report inadequate storage facilities.

The 48 single family residents cite a total of 92 problem mentions which affect the adequacy of waste storage containers at this site. Vulnerability to the effects of weather is the most frequent complaint, cited 28 times by respondents. Dogs are cited as a problem by 20 percent (24) of the respondents, insects (17 complaints), vermin (14 complaints), and odors (9 complaints) also affect container adequacy. A disproportionate number (36 out of 92) of problems are encountered by respondents with a tenure of more than 18 months at this site. The largest concentration of problems is in two adult households (56 out of 92 complaints) and in households with no children (55 out of 92 complaints).

Problems are encountered most frequently by households which fill 3 or more in-house containers each week (64 out of 92 complaints). Seventy-one percent (66 out of 92 complaints) of the problems are voiced by households which use 2 to 3 storage cans each week.

Reasons for these external storage can problems are not given in significant numbers. "Too few cans," "Lacking covers," and "misfitting covers" each receives one mention as a cause of problems.

Evidently, overloading is a significant problem. Also, moderate users of the system (those filling 2 to 3 storage cans per week, and persons who have resided at the site for some time) encounter these problems most frequently.

10.1.3 External Waste Disposal Facilities - Apartments

Inadequate waste storage facilities appears to be a minor problem for apartment dwellers at this site. Chute backups, the most frequently mentioned inadequacy, receives only 4 mentions. A scarcity of containers and the small size of the trash room are each mentioned once as deficiencies. The few problems that are reported are encountered primarily by 2 adult homes (5 out of 6 reported problems) and childless units (6 complaints). Only one equipment operation problem, a chute door malfunction, is reported by the resident of a mid-rise, 2 adult, childless unit.

Eight apartment residents (4 in the low-rise, 4 in the mid-rise) report problems in the use of storage cans or areas. Weather and insects (3 mentions each) are the major reported causes of storage area problems. Odors (2 mentions) and dogs (one mention) are also problems cited. These problems are encountered by 2 adult and childless households (8 complaints).

Households which fill their in-house containers two (2 complaints) and three (3 complaints) times weekly report the majority of the problems. Half of the complaints are from residents with a tenure of more than 18 months at this site.

Lack of container lids (3 mentions), lack of protection for the storage area (3 mentions), too few containers and misfitting covers (1 mention each) are also cited. Half of the respondents giving reasons for storage area inadequacy have lived at this site for longer than 18 months.

10.2 Attitudes About Movement of Wastes to Disposal/Collection Point

10.2.1 Single Family Home Dwellers

Only one single family home resident of the 123 interviewed moves his external storage container to the curbside. That respondent lives in a single family attached dwelling and is presently not retired. This is the only respondent who is not using the central collection area.

Seven respondents see potential dangers in the movement of their wastes to collection points. Falls and weather are the major reported hazards (3 mentions each) followed by the danger of assault, broken glass and insects (1 mention each).

Fears of these hazards are expressed primarily by residents of SFD units (6 of the 9 hazards) and by those residents with a tenure of more than 18 months at this site (5 of the 9 mentioned hazards).

10.2.2 Apartment Dwellers

None of the apartment dwellers reports use of external storage containers. However, five residents (out of 30 respondents) of the medium rise units see hazards in moving their wastes to the collection points. The primary danger reported is falls (5 mentions) but assault and exposure to bad weather are also seen as hazards (one mention each). The group expressing the greatest concern (3 hazards mentioned) has lived at this site fewer than 3 months.

10.3 Complaints about Waste Collection Services

Residents of single-family homes, both SFA and SFD, were specifically queried about the adequacy of the waste collection service which is provided by the municipal government. Apartment dwellers normally have little and infrequent contact with waste collection as their contact with the system ends when they place their trash in the chute. Apartment dwellers were not asked for their opinions in this area.

There are few complaints from single family residents about the waste collection service. Some 38 of 46 (83 percent) of SFD residents and 70 of 77 (91 percent) of SFA residents have no complaints.

The complaints are:

- Trash spillage - 10 mentions total of which 7 are SFD residents and 3 SFA residents
- Trash pickup is not frequent enough - 4 mentions total of which 1 is SFD and 3 are SFA residents
- Certain items, (large boxes), are not picked up - 2 mentions total one each from SFD and SFA residents.

The tenure of the resident is one indicator of the validity of a complaint. Respondents who have lived at the site for longer periods have had more time to observe problem situations. Overall, we found that most complaints are made by residents with more than one year's tenure. Figure 10, below, presents the three complaint categories in terms of the complaint's period of tenure.

Type of Complaint	Length of Residency			
	6 months or less	7 months up to one year	More than One year	Total Number of Complaints
Trash spillage	1	2	7	10
Infrequent pick-ups	0	2	2	4
Uncollected Items (Boxes)	2	0	0	2
TOTAL	3	4	9	16

FIGURE 11: TENURE OF COMPLAINANTS

10.4 Resident Attitudes About Problem Resolution

Residents were asked whom they would contact in the event that they encountered a trash collection problem. Despite a municipal agency's role in trash collection, most of the residents (88 percent or 134 of 153 respondents) would contact the site manager. Only 17 residents would contact the city sanitation agency. One resident states that he does not know whom to contact. Of the 17 residents who would contact the city agency directly, 9 live in the SFD homes, 7 are from the SFA homes and 1 resides in an MFMR unit.

Only 8 respondents, all single family residents, indicate that they actually have had problems which required resolution. Of these, five feel that their problems were satisfactorily resolved. The other three respondents feel that their problems have not been properly resolved. Two of these displeased residents reside in the SFD homes, the other is an SFA resident. All three have resided at Park Lafayette for more than 18 months.

Overall, few of the residents have serious trash collection problems requiring intervention of the site manager. Residents who had problems have, for the most part, had their problem resolved satisfactorily.

10.5 Resident Attitudes Towards the Cost of Collection

None of the residents is aware of charges paid (either directly or indirectly through their rent) for trash collection. Thus, residents did not respond to questions about the cost of the trash collection services.

10.6 Resident Awareness of Service Providers and Innovations

An unusually high number of residents are not aware that the City of Indianapolis is providing their waste collection services. Only 57 percent (26 of 46) of the SFD residents and 31 percent (24 of 77) SFA residents know they are being served by a municipal agency. Only two of the 30 multi-family unit residents know that the city is servicing their areas.

Residents who indicate otherwise either state that site management provides trash collection service (21 mentions) or do not know (80 mentions). Aggregated by housing type these incorrect impressions are: 20 SFD responses; 53 SFA responses' 8 MFLR and 20 MFMR responses. This misinformation correlates high with resident misimpressions about whom they would complain to for waste collection problems, discussed in Section 11.4.

Residents are relatively unaware of innovative solid waste disposal techniques or equipment used at the site, despite use of such equipment as centrally located facilities in the single-family and MFLR areas, and trash chutes and central bins with compaction devices in the medium-rise buildings. Only five of 153 residents, or three percent, are aware of such devices at Park Lafayette. The information was solicited in a manner which did not bias their their awareness. If a respondent answered that he was not aware of innovations, then the question of what these innovations are was not asked. No prompting or extensive probing of respondents was attempted.

In summary, the nature of this resident awareness of innovations is:

- Three residents mention central storage areas - 1 SFA and 1 MFMR
- One mentions compactor - the same person who owns and uses such a device in home
- One mentions trash chutes - interestingly this person is an SFA resident and not an MFMR dweller where such devices are used.

3

SEATTLE, WASHINGTON

SECTION I

CONCLUSIONS

The analysis of the data collected from the site manager and residents of Bryant Manor Apartments supports conclusions on management and resident perceptions and attitudes on the following issues:

- Adequacy of trash storage and collection facilities and services
- Trash and bulky waste storage requirements and practices of residents
- Resident awareness and opinions about the solid waste disposal system operations, costs, and their responsibilities and point of interaction for resolving problems
- Suitability of the system to the environment.

1.1 Conclusions About the Site Management's Attitudes and Impression

The Site Management interview was conducted on January 22, 1975. The site management representative expressed no overall opinion about the suitability of the system, the extent of resident problems or the degree of resident cooperation. Site management is actively involved in the operation of the waste disposal system at this site and has established channels through which residents may request special collection service and file complaints about trash removal service. Management maintains a file on complaints which serves as a basis for follow-up.

1.2 Conclusions About the Residents' Requirements, Attitudes, and Opinions

Bryant Manor Apartments is a housing complex of primarily small families with a substantial number of retired persons. In-house storage capacity is typically limited and wastes are not stored immediately outside of the housing unit but are disposed of through a communal system of trash chutes and external bins.

Most of the respondents (69 percent) use plastic bags to store their in-house trash although site management does not require this. The most common items stored in these in-house containers, in order of frequency, are paper, packaging, glass bottles, plastic items, cardboard, food wastes, newspapers, and magazines.

Residents fill their in-house storage containers approximately twice a week. None of the respondents reports separating waste for disposal.

Although most of the respondents (95 percent) find the disposal system adequate, over half indicated potential personal hazards (falls and criminal assaults, primarily) in their use of the external storage facilities.

SECTION 2
RECOMMENDATIONS

Based on the conclusions reached, recommendations are warranted to:

- Overcome substantial resident concerns about personal safety involved in the movement of trash to collection/disposal points.

Over half of the respondents at this site express fears of danger when conveying trash from their homes to the collection/disposal points. Fear of criminal assault is the most often mentioned hazard. Half of the respondents expressing this fear are retired. Possible falls are also indicated as a danger to the residents. In this instance two-thirds of those expressing the fear are retired.

Although the above are the only major dissatisfactions expressed about the disposed system, they are severe enough to warrant further investigation. The high incidence of reported fears from the retired suggests that they are age-related and may be indicative that the system is unsuitable for the aged.

Reexamination of the system to determine its suitability to the elderly (e.g., distances of bins from units, physical strength required to open bin doors, etc.) is warranted by the rather high level, 55 percent, of retired respondents interviewed. An immediate need, however, is for surveillance of and installation of proper security at the bins to lessen resident fears of criminal assault. Of equal importance is the elimination of any physical hazards which might cause serious falls -- a major fear at this site.

SECTION 3
PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

3.1 Size and Location of Site

The Seattle Operation Breakthrough Site consists of 1.8 acres The site is located 1.5 miles from the Central Business District of Seattle, Washington.

3.2 Land Characteristics

The site is part of the urban renewal and model cities areas in downtown Seattle and is located in the Yesler Atlantic Neighborhood Improvement Project.

3.3 Description of Site

The site contains 58 units of medium-rise and low-rise apartments and townhouses. Overall density of the site is approximately 32 units per acre. The apartments overlook an adjacent six acre city park and are arranged around a landscaped court which serves as the site focus.

Parking, planned at 1.2 cars per unit, is below grade to minimize the impact of the automobile on the environment of this small urban site. A focus for community activity is provided by a 2,000 square foot community room in which workshops, a kitchen, and meeting spaces are located.

SECTION 4
CHARACTERISTICS OF SITE HOUSING

A discussion of the housing on the site is presented in this section. The focus is on amount and type of housing, rather than on the physical and/or architectural housing characteristics. The occupancy level, length of occupancy, and housing costs are discussed.

4.1 Types and Numbers of Housing Units

There are two types of housing on the site. They are single-family attached (SFA) and multi-family low rise (MFLR) dwelling units.

Bryant Manor Apartments has 38 SFA units which have 2, 3 or 4 bedrooms. There are 20 MFMR apartments which have 2 or 3 bedrooms.

The site has a total of 58 units of which 42 were included in the sample for the resident survey. All data presented are derived from the sample and are summarized together for all units.

4.2 Ownership and Occupancy

The site manager was interviewed on January 22, 1975. The site manager reported full occupancy (100 percent). All of the occupied units are being rented. The rental range is shown below in Figure 1.

Housing Type	Number of Bedrooms	Monthly Rental Range
MFLR/SFA	2 to 4	$100 - $200

FIGURE 1: RENTAL RANGE

The length of occupancy is an important characteristic to note as it provides a baseline of resident experience against which to measure attitudes and perceptions about the site and the solid waste disposal system. Tenure ranges from less than three months to more than 18 months across the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	Dwelling Type	
	MFLR	
	No.	%
Less than 3	3	7
4 to 6	1	2
7 to 9	2	5
10 to 12	4	10
13 to 18	6	14
More than 18	26	62
Total	42	100%
Average Tenure	41.4 months	
Median Tenure	30.5 months	

FIGURE 2: TENURE OF RESIDENTS BY DWELLING TYPE

SECTION 5
RESIDENT CHARACTERISTICS

The characteristics of Bryant Manor residents are presented in terms of three factors: retirement status, number of adults, and number of children. Other types of demographic data were not collected in the survey.

5.1 Retirement Status of Household Heads

Twenty-three of the 42 household heads report that they are retired. The respondents have lived there from less than three to more than 18 months.

5.2 Number of Adults and Children

For the 42 units, population data are specifically categorized by the number of adult and child residents per unit as follows:

- **Adults**
    - 1
    - 2
    - 3
    - 4 or more
- **Children**
    - 0
    - 1
    - 2
    - 3
    - 4 or more

Forty-nine adults and 12 children live in the sampled units. Thirty-five units, however, have no children. Specific population data are presented in Figure 3.

Number of Adults Per Unit	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	35	0	0
1	37	37	1	4	4	41
2	3	6	2	1	2	8
3	2	6	3	2	6	12
4 or more	0	0	4 or more	0	0	0
Total	42	49	Total	42	12	61

FIGURE 3: POPULATION

SECTION 6

SUMMARY OF THE SITE MANAGERS' PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of site management's understanding of the extent of solid waste collection/disposal facilities and services, of expected resident practices in storing and disposing solid wastes, of regulations governing resident storage and disposal actions and of use of facilities and services, of limitations, of services, and of charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and collection/disposal of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilities.

Some units use one of two trash chutes; in addition, outdoor storage bins are available for the direct placement of trash.

6.2 Expected Resident Storage and Disposal Practices

Residents at this site are expected to dispose of their wastes in the trash chutes or to deposit trash in the outdoor collection bins.

6.3 Site Rules and Regulations

The written site rules and regulations prepared by site management and distributed to each unit essentially consists of specifications about the location and usage of the chutes and trash bins. Special bagging or trash separation is not required.

6.4 Limitations on Disposal Volume and Service Charges

There is no limitation on the amount or kind of household trash which can be disposed of through the system.

The costs of trash removal are borne by the residents indirectly through their rental payments.

SECTION 7

RESIDENTS' SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains data describing the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- Location of disposal site

7.1 Disposal of Bulky Wastes

The principal issues regarding bulky waste disposal and collection practices are:

- Site management or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for large and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

Site management has provided residents with written rules for the disposal of trash. Essentially, these "rules" specify the location of trash chutes and external storage bins and inform the resident that trash must be deposited in these locations.

7.1.2 Placement of Large and Small Bulky Wastes

Small bulky wastes include yard wastes, small appliances and bulky cardboard items. Large bulky wastes include such items as furniture and discarded major appliances.

Of the 42 respondents at this site, none indicates separating either large or small bulky items from their regular household trash.

7.1.3 Responsibility for Bulky Waste Collection

Site management reports no specific provisions for the removal of bulky waste items. Ninety-three percent (39 out of 42) view local government as bearing the responsibility for the collection of small and large bulky waste items. The remaining 7 percent of the respondents feel that site management is responsible for this service (See Figure 4 Below).

	Small Items	Large Items
Local Government	39	39
Management	3	3
Total	42	42

FIGURE 4 : RESIDENT UNDERSTANDING OF BULKY WASTE DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

Bulky wastes disposal methods are: bulk waste collection included in the regular trash pick-up, collection by "special" pick-up, and pick-up requested the resident.

Ninety-five percent (40 out of 42) of the respondents indicate that small bulky items are collected with their regular trash. The remaining 2 respondents do not know how such items are collected.

Forty of the 42 respondents reportedly have obtained collection services for large bulky items through regularly scheduled special pickups. Two respondents do not know how to obtain removal service for large bulky items.

7.2 Separation of Wastes

There are no site rules which require residents to separate bulky wastes, glass, plastics, newspapers, food wastes, or other items before collection. None of the residents separates small or large wastes from his regular trash for collection. The data indicate, in fact, that none of the residents at this site separates any items from his regular trash (Figure 5).

Resident Action	Percentage of Residents	Number of Cases
Frequency of Trash Separation	0	0
Frequency of Non-Separation	100	42
TOTAL	100%	42

FIGURE 5: EXTENT OF RESIDENT TRASH SEPARATION

7.3 In-Home Solid Waste Storage

The primary in-home solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined cans, and other unspecified types.

Plastic trash bags are used by 69 percent (29) of the respondents while grocery bags are used by 31 percent (13) of the sample. No usage of either a compactor, unlined can or other form of in-home container is reported.

Residents store the following items in their in-home containers: paper and packaging, glass bottles, plastic items, cardboard items, newspapers, magazines and food wastes.

Figure 6 presents the number of respondents who report the types of waste they store in their in-home containers.

Type of Waste	No. of Responses[1]	% of Responses
Paper/Packaging	42	100%
Glass Bottles	42	100
Plastic Items	42	100
Cardboard	42	100
Newspapers	39	93
Magazines	37	88
Food Wastes	41	98

[1] Out of a total of 42 units surveyed

FIGURE 6 : TYPE OF WASTES STORED IN IN-HOUSE CONTAINERS

Figure 7 presents data on the frequency of filling in-house storage containers.

In-House Storage Fill-up Characteristics	Housing Type MFLR
Average times fill-ups per week	2.3
Number and percent reporting three or more fill-ups per week	17 of 42 (41%)
Number and percent reporting daily or more than daily fill-up	0 of 42 (0%)

FIGURE 7 : FREQUENCY OF FILL-UP IN HOME STORAGE CAPACITY, BY HOUSING TYPE

7.4 Disposal Site

All of the respondents report using the external storage bin for disposal of their wastes. Twenty-one percent (9) of the respondents state that they move their trash less than 25 feet to an external storage bin. Ninety-five percent (40) are within 50 feet of a bin. The remaining 2 respondents are from 50 to 75 feet from the external bin.

SECTION 8

RESIDENTS' UNDERSTANDING OF THEIR RESPONSIBILITIES, COSTS AND FREQUENCY OF SERVICES

This report section presents quantitative and qualitative data from interviews of site management personnel and from residents. The focus of the section is on resident awareness of site management policy and responsibility for solid waste collection services, payments for these services, and the frequency of occurrence.

8.1 Responsibility for Solid Waste Collection

8.1.1 Household Trash

The management respondent at this site states that the collection of household trash for all types of dwelling units is a service performed by local government. Resident awareness of the provider of collection services is mixed. A large number, 71 percent (30), of the respondents accurately reports that collection of regular wastes is a local government service. Seventeen percent (7) of the respondents think the service is provided directly by site management. Five (12 percent) of the respondents are unaware of provider of the service.

Although 2/3 of the correct responses are from residents with a tenure at this site of more than 18 months, 3/4 of the incorrect respondents also had tenure at this site in excess of 18 months. A clear relationship between tenure and awareness of the service provider is not evident.

8.1.2 Bulky Wastes, Including Yard Wastes

The property management respondent reports that yard maintenance for all dwellings at this site is the responsibility of management personnel; this maintenance responsibility includes the removal of all yard wastes. The site management respondent states that site management personnel are available to receive requests for special collection service. All of the respondents report knowing a source for large and small bulk waste item removal.

8.2 Resident Responsibilities for Payment of Service Charges

This section covers resident awareness of regular charges and special charges levied for trash collection and removal of yard wastes and bulky wastes. The text compares aggregate resident awareness levels with management perceptions in Section 7.

8.2.1 Resident Awareness of Type of Charges

Only one of the 42 respondents at this site reports any charges for the collection of small bulky items, although 5 respondents state only that they do not know of any of these charges. The response for large bulky waste removal was the same.

No actual payment of a removal fee is reported for the collection of either a small or large bulky item.

All respondents report that they do not pay a direct service charge for regular waste collection services. No respondent reports any charge for the collection of additional containers.

Overall, the residents at this site are aware of the indirect nature of charges for waste removal; however, these charges prompt neither positive nor negative attitudinal responses.

8.3 Frequency of Services - Resident vs. Management Perceptions

This section compares management and resident perceptions of the frequency of regular trash collection services.

Trash is collected twice weekly at this site.

Forty-one of the 42 respondents (98 percent) report the waste storage facilities adequate. One respondent, however, observes that too few storage containers are available.

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

To assess the suitability of the system to the environment, respondents were asked for their opinions on unpleasant environmental effects such as odors, trash spillage causing littering effects, pets, and effects of weather causing flooding in trash storage areas, and littering.

9.1 Environmental Impacts

Forty of the 42 respondents (95 percent) report that the storage bins used at this site are adequate. The expressions of container inadequacy come from two residents who have lived at this site longer than 13 months.

Susceptibility to household pets is twice mentioned as an inadequacy of the storage bins. One respondent mentions insects as a problem. The complaints all come from one adult homes with no children. One respondent gives the reason, "too few containers" for these problems. That respondent, the sole occupant of his unit, has lived at the site longer than 13 months.

9.2 Summary of Environmental Impacts Caused by Systemic Inadequacies

Environmental concerns are adequately met by the facilities available to the residents at this site. Only a few (3) respondents complained, and one systemic inadequacy (shortage of containers) is reported.

SECTION 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystems. The principal components investigated were:

- trash compactors
- external storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

10.1 Resident Attitudes Toward Suitability of Facilities and Equipment

10.1.1 Trash Compactor

No trash compactors are reported in use at this site.

10.1.2 External Waste Disposal Facility

One respondent supplies a reason for waste storage facility inadequacy, "too few containers." This respondent is retired and is the sole occupant of his unit. He fills an internal container three times each week. The respondent has lived at this site between 13 and 18 months.

Eight respondents report having experienced problems in the operation of the waste disposal equipment. One respondent, a retired resident living at this site between 13 and 18 months, has had trouble with the trash chute door. Seven respondents, five of whom are retired, report difficulty with the storage bin lid. Six of these respondents have lived at this site between 13 and 18 months

Two environmental concerns are reported: household pets (2 mentions) and insects (1 mention). The two residents reporting these problems are the sole occupants of their home. Each fills in-home containers twice weekly and has lived at this site between 13 and 18 months. Three reasons for these problems with storage containers are given: "too few containers," "misfitting covers," and "uncleanliness" (1 mention for each reason).

10.2 Attitudes About the Movement of Wastes to Disposal/Collection Point

The respondents move their trash an average of 29 feet to a chut or trash bin. Only 2 respondents, 1 retired, report having to move their trash between 50-75 feet to a disposal/collection point.

Potential dangers in moving wastes to the trash chute or storage bin are reported by substantial numbers of respondents. Some 36 percent of the respondents (15) express fear of criminal assault while moving their trash. Eight of the 15 respondents expressing this fear are retired. Fear of falls is reported by 9 of the respondents, of whom 6 are retired. Of 26 mentions of fears, 19 come from residents at this site with a tenure of more than 18 months.

10.3 Attitudes About Problem Resolution

Residents were asked whom they would contact if they encounter a trash disposal or collection related problem. All 42 of the respondents state that they contact site management for problem resolution.

Only 3 of the respondents report actually having had problems with the trash collection system. All 3 of these problems were resolved.

10.4 Resident Attitudes About the Cost of Collection

None of the 42 survey respondents pays directly for the cost of their trash collection and all are aware of the indirect nature of the service charge. Respondents express no opinion about the costs.

10.5 Resident Awareness of Service Providers and Innovations

Resident awareness of the provider of regular waste collection services is mixed. Seventy-one percent (30) of the respondents correctly identify local government as the service provider. Seventeen percent think site management provides the service; this misapprehension is probably related to site management's role in keeping the storage facilities clean.

None of the respondents at this site reports awareness of any innovative solid waste disposal technique or equipment in use at the site.

4

KALAMAZOO, MICHIGAN

SECTION 1

CONCLUSIONS

The analysis of the data collected from the site manager and residents of New Horizon Village resulted in conclusions on management and resident perceptions and attitudes on the following issues:

- Adequacy of trash storage and collection facilities and services
- Trash and bulky waste storage requirements and practices of residents
- Resident awareness of, and opinions about, the solid waste disposal system operations, costs, and their responsibilities and point of interaction for resolving problems
- Suitability of the system to the environment.

1.1 Conclusions About the Site Management's Attitudes and Impressions

New Horizon Village site management expressed no overall opinion about the suitability of the system, the extent of resident problems, or the degree of resident cooperation. Site management reports problems with SFA residents who do not put trash in the compactors and with children who do not push the button to activate the compactor system.

Site management is responsible for collection services and is responsible for the maintenance of the site.

1.2 Conclusions About the Residents' Requirements, Attitudes and Opinions

The variety of housing types at New Horizon Village is responsible for the varied disposal methods and patterns. Residents of single family homes generate substantially more refuse than do residents of multi-family units.

Plastic trash bags are used for in-home waste storage by 41 percent of the respondents while 44 percent of the respondents use grocery bags for that purpose. The most common items stored in these in-house containers (in order of high to low frequency) are paper, packaging, cardboard, plastic items, newspapers, magazines, glass bottles, cans, and food wastes.

On the average, respondents fill their in-house containers about three times weekly. Almost 50 percent of the single family units fill their in-house storage containers daily or more than daily.

Sixty-six percent of the respondents in single family units feel that their waste storage containers are inadequate. This contrasts sharply with the 19 percent of the multi-family units reporting this complaint. Further, problems of overloading and of infrequent collections are reported extensively by the resident at this site.

Residents of all but the MFMR units report extensive environmental problems such as trash scattering by household pets, odors and insects.

The number of complaints (17) about the quality of waste collection services was relatively small. All but one of the residents state that they report any trash collection problem to Site Management. Sixty-one percent of the respondents experiencing a waste collection problem had the problem resolved. Interestingly, all of the unresolved problems are reported by respondents whose tenure at this site exceeded 18 months.

SECTION 2

RECOMMENDATIONS

Based on the conclusions reached, recommendations are warranted to:

- remedy the frequency of overloading at this site
- lessen the effects of household pets on external waste storage facilities

2.1 Remedying the Frequency of Overloading at this site

Sixty percent of the respondents residing in single family homes at this site report weekly overloading of the external storage facility. Factors which are contributory to this are tw major deficiencies expressed by the residents: infrequent trash collections and a shortage of containers. The overloading probl is concentrated primarily in single family units and Site Management should study the feasibility of increasing either the frequ of collection or the capacity of the external storage facilities

2.2 Lessening the Effects of Household Pets on Waste Storage Facilities

Forty-four percent of the complaints about this system's env mental inadequacy involve the effects of household pets on the external storage facilities. Apparently, existing storage facil are susceptible to the effects of pets who forage in the contain and scatter much of the trash therein.

Site Management should consider alternate forms of external storage containers resistant to household pets and should explor the methods by which residents may be held accountable for controlling the actions of their pets.

SECTION 3

PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

3.1 Size and Location of Site

The Kalamazoo Operation Breakthrough Site consists of 33.8 acres. The site is located two miles northeast of the Kalamazoo Central Business District. Driving time to the Central Business District is about ten minutes.

3.2 Land Characteristics

The site is a gently rolling plateau. It is located on formerly undeveloped park land overlooking a lake in Spring Valley Regional Park. Adjacent land uses are primarily single family dwellings; however, the Cherrywood Terrace Garden Apartment Complex is located on the western boundary.

3.3 Description of Site

The site contains 245 units of medium and low density building types. These are characterized as either single family attached and single family detached residences and multi-family medium rise and low rise structures. The overall density of the sites is 7.2 units per acre. The cluster planning approach is used to separate vehicular and pedestrian circulation. This approach also reduces the amount of land required for paved roadways from 25 to 35 percent in grid pattern developments to this site's 18 percent land use for roads. Parking is planned at two cars per unit.

Cluster design provides small open play areas for children which are linked by linear greenways to neighborhood playfields and a lake. This unifying open space network complements the natural environmental qualities of the site.

3.4 Special Environmental Considerations

Possible run off and resulting pollution of Spring Valley Lake by contaminates and hydrocarbons in drainage were major environmental concerns at this site. To prevent this, the storm water drainage system is designed with leaching catch basins.

SECTION 4

CHARACTERISTICS OF SITE HOUSING

A discussion of the characteristics of the site is presented in this section. The focus is on number and type of housing rather than on the physical and/or architectural housing characteristics. The occupancy level, length of occupancy, and housing costs are also discussed.

4.1 Types and Numbers of Housing Units

Four different types of housing exist at this site: single-family attached (SFA), single-family detached (SFD), multi-family low rise (MFLR), and multi-family medium rise (MFMR).

The largest group is SFA with 127 units having 2, 3, or 4 be rooms. There are 52 MFLR and 52 MFMR units. The MFLR units are 1, 2, or 3 bedroom dwellings, and the MFMR units have either 1 or 2 bedrooms.

The SFD units are smallest in number with only 14 units. They are 3, 4, or 5 bedroom houses.

Of the total of 245 units, 118 comprise the sample for the resident survey. All data which are presented are derived from the sample which is stratified by housing type as follows:

Single family detached	14 units
Single family attached	127 units
Multi-family low rise	52 units
Multi-family medium rise	52 units

4.2 Ownership and Occupancy

The site manager was interviewed on January 20, 1975. The site was occupied at a 98 percent level. Management knew neither what level of occupancy represented "full occupancy" nor when full occupancy would be reached. The rental rates are shown below:

Housing Type	Number of Bedrooms	Monthly Rental Range
SFA	2 to 4	$147 to $298
SFD	3 to 5	$165 to $308
MFLR	1 to 3	$118 to $256
MFMR	1 to 2	$105 to $237

FIGURE 1: RENTAL RANGES BY HOUSING TYPE

The length of occupancy (tenure) is an important characteristic as it provides a baseline of respondent experience against which to measure attitudes and perceptions about the site and the solid waste disposal system. Tenures range from less than three months to more than 18 months for the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	Dwelling Type								No. and % by tenure	
	SFD		SFA		MFLR		MFMR			
	No.	%	No.	%	No.	%	No.	%	Total	%
Less than 3	0	0	6	10	4	16	2	8	12	10
4 to 6	1	14	10	16	5	20	0	0	16	14
7 to 9	1	14	9	15	1	8	0	0	12	10
10 to 12	0	0	4	6	4	16	1	4	9	8
13 to 18	1	14	0	0	2	12	1	4	5	4
More than 18	4	58	32	53	7	28	21	84	64	54
Total	7	100%	61	100%	25	100%	25	100%	118	100%
Average Tenure	18.8 months		17.7 months		12.5 months		18.4 months			
Median Tenure	18.0 months		17.7 months		11.7 months		32.6 months			

FIGURE 2: TENURE OF RESIDENTS BY DWELLING TYPE

SECTION 5

RESIDENT CHARACTERISTICS

Resident characteristics are presented in terms of three factors: retirement status, number of adults, and number of children. Other types of demographic data were not collected in this survey.

5.1 Retirement Status of Household Heads

Thirty-seven of the 118 household heads report that they are retired. Most of the retirees (24 out of 37) have lived at this site longer than 18 months and are concentrated in MFMR units (25 out of the 37 retired respondents).

5.2 Number of Adults and Children

For the 118 units, population data are sepcifically categorized by adult and child residents per unit as follows:

- Adults
  - .. 1
  - .. 2
  - .. 3
  - .. 4 or more

- **Children**
  - 0
  - 1
  - 2
  - 3
  - 4 or more

Use of this type of categorization limits the precision of population data to minimum numbers of adults and children. It is not possible to state that a specific number of persons live in the 118 sampled units. It is possible to say that at least 194 adults and 127 children reside in the sampled units, and that one unit contained four or more adults and five units contained four or more children. 54 units had no children. Specific population data by housing type are discussed below.

5.2.1 Adults and Children in Single Family Detached Homes

Fifteen adults and at least 13 children, a total of at least 28 persons, reside in the seven single family detached units included in the sample. No SFD units report four or more adults; two units report four or more children. Two SFD units report no children. Figure 3 presents the adult and children population of SFD units as well as the frequency of SFD units by number of adults and children per unit.

Number of Persons per Unit	ADULTS		Number of Children per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Persons		Number of units	Number of Persons	
0	--	--	0	2	0	0
1	0	0	1	1	1	1
2	6	12	2	2	4	16
3	1	3	3	0	0	3
4 or more	0	0	4 or more	2	8	8
Total	7	15	Total	7	13	28

FIGURE 3: POPULATION OF SFD UNITS

5:2.2 Adults and Children in Single Family Attached Homes

At least 207 persons resdie in the single family attached homes sampled during the survey period. Of these, at least 111 are adults and at least 96 are children.

One respondent reports four or more adults living in his unit and three respondents indicate four or more children residing with them. The adult and children population of SFA homes along with the frequency of SFA units by numbers of adults and children per unit is presented in Figure 4.

Number of Persons per Unit	ADULTS		Number of Children per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Persons		Number of Units	Number of Persons	
0	--	--	0	11	0	0
1	18	18	1	20	20	38
2	37	74	2	17	34	108
3	5	15	3	10	20	45
4 or more	1	≧ 4	4 or more	3	≧ 12	≧ 16
Total	61	≧111	Total	61	≧ 96	≧207

FIGURE 4: POPULATION OF SFA UNITS

5.3.3 Adults and Children in Multi-family Units

Exact population responses were obtained for all 50 surveyed multi-family units. Eighty-eight persons live in the sampled multi-family units, 60 reside in the 25 low rise units and 28 reside in the 25 medium rise units. Of the total, 18 are children and all 18 live in the MFLR.

The population of adults and children in both MFLR AND MFMR units is displayed in
adults per unit data and total residents sampled for all multi-family housing.

Number of Adults Per Unit	Multi-Family Medium Rise					
	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number Of Units	Number of Adults		Number Of Units	Number of Children	
0	--	--	0	25	0	0
1	22	22	1	0	0	22
2	3	6	2	0	0	6
3	0	6	3	0	0	0
4 or more	0	0	4 or more	0	0	0
TOTAL	25	28	TOTAL	25	0	28

FIGURE 6: POPULATION OF MULTI-FAMILY MEDIUM RISE HOUSING

Number of Adults Per Unit	Multi-Family Low Rise					
	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number Of Units	Number of Adults		Number Of Units	Number of Children	
0	--	--	0	16	0	0
1	8	8	1	3	3	11
2	27	34	2	3	6	40
3	0	0	3	3	9	9
4 or more	0	0	4 or more	0	0	0
TOTAL	25	42	TOTAL	25	18	60

FIGURE 5: POPULATION OF MULTI-FAMILY LOW RISE HOUSING

SECTION 6

SUMMARY OF THE SITE MANAGER'S PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of the site management's understanding of the extent of solid wast collection/disposal facilities and services, of expected resident practices in storing and disposing solid wastes, of regulations governing resident storage and disposal actions, of use of facilities and services, of limitations of services and of charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and compaction of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilities. The discussion which follows presents the application of such facilities and services for each type of housing.

6.1.1 Single Family Homes

Both SFD and SFA residents provide and maintain internal and external storage cans. When filled, storage cans are moved by the resident to outdoor central collection areas which are located throughout the site. These central collection areas are emptied daily by site management personnel. Site personnel periodically clean, disinfect, and maintain the collection areas.

6.1.2. Multi-Family Low Rise Units

MFLR units are provided with outdoor central collection areas where trash is collected daily.

Yard maintenance and the disposal of yard wastes are the responsibilities of site management.

6.1.3 Multi-Family Medium Rise Units

MFMR units are provided with trash chutes on each floor which convey wastes to a central compactor. Compacted waste is removed daily from the storage area.

6.2 Site Manager's Expectations of Resident Storage and Disposal Practices

Residents of single family homes and MFLR units move and place all their trash into the outdoor central collection areas located throughout the site. MFMR residents use the trash chutes located on every floor of their building. Site management requires residents to separate trash. Yard wastes are collected and removed by the site management.

Site management removes large and small bulky wastes.

6.3 Site Rules and Regulations

At the time of the survey, the site management had not prepared or published any rules governing the operation of the solid waste disposal system. The only apparent regulation was that residents separate glass from their regular wastes destined for compaction.

6.4 Limitations on Disposal Volume and Service Charges

There are no limitations on the amount of household trash which a single family or multi-family resident can dispose of during any specific period. There is no specific provision or limitation on the amount or kind of bulky waste which can be disposed of through the system.

The cost of the trash collection services, which are provided directly by site management, is included in the basic monthly rent of each occupant. There were no reported additional fees for special pick-up service.

SECTION 7

RESIDENTS' SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains all the data describing the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- External solid waste storage practices (single family houses)
- Location of disposal site (apartments)

7.1 Disposal of Bulky Wastes

The principal issues regarding bulky waste disposal and collection practices are presented here. These issues include:

- Site management or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for large and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

There are no written site management or trash disposal service rules or regulations governing the disposal and collection of bulky waste.

7.1.2 Placement of Large and Small Bulky Wastes

Small bulky wastes include yard waste, small applicances, and bulky cardboard items. Large bulky wastes include such items as furniture and discarded major appliances.

Of the 118 respondents interviewed at this site, 72 percent (85) indicate that they separate small waste items from their regular trash while 99 percent (117 respondents) separate large items from their regular waste before collection.

Separation of small bulky items from regular trash is performed in 43 percent (3 out of 7) of SFD units, 90 percent (55 out of 61) of SFA units, and 96 percent (24 out of 25) of MFLR units; however, only 11 percent (3 out of 25) of MFMR respondents make it a practice to separate small bulky waste from regular household trash.

7.1.3 Responsibility for Bulky Waste Collection

Site management accepts responsibility for the removal of bulky waste at no additional charge to the residents. Management responsibility for small bulky waste collection is understood by 72 percent of the respondents; however, 88 percent (22 out of 25) of the MFLR responsdents did not know who collected small bulky wastes. Seventy percent of all site respondents do not know who was responsible for large bulky waste collection.

Figure 6, below, presents data on respondent understanding of bulky waste removal responsibility.

	Small Items	Large Items
Local Government	0%	0%
Management	72	26
Taken to Dump	< 1	3
Private Collection Service	< 1	< 1
Don't Know	26	70
Total	100%	100%

FIGURE 6: RESIDENT UNDERSTANDING OF BULKY WASTE DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

Bulky wastes are disposed by collection in the regular trash pick-up, by "special" pick-up, and by pick-up requested by the residents.

Sixty-nine percent (81 out of 118) of the respondents indicate that small bulky waste is collected with regular trash, a figure composed of 82 percent of the single family unit respondents and 50 percent of the multi-family unit respondents. Only one respondent (SFA) reports calling to request a trash pick-up.

Thirty-four percent of the single family respondents report that large bulky wastes are collected with their regular trash. Fifty-seven percent (39 out of 68) do not know how to have large bulky items collected. The respondents of the multi-family units are unaware of the mode of collection for large bulky items.

7.2 Separation of Waste

Site management requires separation of wastes of residents of MFLR, SGA, and SFD units.

Small bulky wastes are separated from the regular trash by 72 percent of the residents. Large bulky wastes are separated from regular wastes by over 99 percent of the residents.

Figure 7 presents data on waste separation.

Resident Action and Items	Percentage of Residents	Number of Cases
Separate Household Trash Items:		
Glass	78	92
Bulky Wastes	<1	1
Plastics	3	4
Food Wastes	33	39
Newspapers and Magazines	10	12
Other	16	19
Frequency of Trash Separation	87	103
Frequency of Non-Separation	13	15
TOTAL	100%	118

FIGURE 7: EXTENT OF RESIDENT TRASH SEPARATION

7.3 In-Home Solid Waste Storage

The primary in-home solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined can, and other unspecified types.

Plastic trash bags are used by 41 percent of the respondents while grocery bags are used by 44 percent of the sample. No in-home compactor is used at this site.

Respondents store the following items in their in-home containers: paper, packaging, glass bottles, plastic items, cardboard, newspapers, good wastes, and miscellaneous items such as cans.

Figure 8 presents the number of responsdents and the percentage of respondents who reported the types of waste they store in their in-home containers:

Type of Waste	No. of Responses[1]	% of Responses
Paper/Packaging	118	100%
Glass Bottles	30	25
Plastic Items	93	79
Cardboard	98	83
Newspapers	38	32
Magazines	31	26
Food Wastes	14	12
Other: Cans	18	15

[1] Out of a total of 118 units surveyed

FIGURE 8: TYPE OF WASTES STORED IN IN-HOME CONTAINERS

Residents of single family detached homes fill their in-home storage containers far more frequently than residents of other types of housing. This is attributed to the fact that family sizes are larger in the SFD homes. Figure 9, below, presents the average frequency of filling in-home storage containers by housing type, as well as the number and percent of residents in each housing type who fill their in-home capacity three or more times per week.

In-House Storage Fill-up Characteristics	HOUSING TYPE			
	SFD	SFA	MFLR	MFMR
Average number of fill-ups per week	3.4	3.2	2.8	2.8
Number and percent reporting three or more fill-ups per week	6 of 7 (86%)	50 of 61 (82%)	19 of 25 (76%)	13 of 25 (52%)
Number and percent reporting daily or more than daily fill-up	4 of 7 (57%)	28 of 61 (46%)	6 of 25 (24%)	8 of 25 (32%)

FIGURE 9: FREQUENCY OF FILL-UP OF IN-HOME STORAGE CAPACITY IN EACH HOUSING TYPE

7,3.1 Use of Trash Compactors

No respondent reported the use of an in-home trash compactor.

7.4 External Solid Waste Disposal Practices

The practices for storage and disposal of solid wastes outside the home are related to the type of housing unit. For single family home, solid wastes, in excess of in-home storage capacity, are placed outside in an exterior container; when full the trash is moved to a central collection area. Apartment dwellers face the same needs; however, the excess storage facilities are typically congregate in nature.

7.4.1 External Storage for Single Family Residents

Respondents use three types of external storage containers: metal cans, plactic cans, and plastic bags. Six out of seven SFD respondents filled four or more external storage containers each week. SFA residents fill an average of 3.4 containers weekly.

J.4.2 Disposal for Apartment Residents

All MFMR respondents use the trash chutes located on each floor. MFLR residents report use of compactor facilities and outside bins. MFLR respondents carry their trash an average of 38 feet to a disposal facility. For MFMR residents, the average distance trash is carried to a trash chute is 45 feet.

SECTION 8

RESIDENT'S UNDERSTANDING OF THEIR RESPONSIBILITIES, COSTS AND FREQUENCY OF SERVICES

In this section, quantitative and qualitative data taken from interviews of site management personnel and from residents are evaluated to establish resident awareness of site management policy and arrangements regarding responsibility for providing solid waste collection services, payments for such services, and their frequency of occurrence.

8.1 Responsibility for Solid Waste Collection

8.1.1 Household Trash

The management respondent at this site stated that the collection of household trash from all types of dwelling units is a service performed by site management personnel. Eighty-seven percent (118) of the respondents correctly identified site management personnel as the source of collection services.

8.1.2 Bulky Wastes, Including Yard Wastes

The property management respondent reported that yard maintenance for all dwellings at this site is the responsibility of management personnel; this maintenance responsibility includes the removal of all yard wastes. The management respondent also indicated that special collection services could be requested and obtained by a resident's phone call to the management office. Resident awareness of this management responsibility is high as at least 72 percent rely on property management personnel for the removal of large and small bulky wastes.

8.2.1 Resident Awareness of Type of Charges

No respondents at this site reported having paid fees for the removal of large bulky items. Twenty-five respondents did not know if there was a charge for removing bulky items.

8.3. Frequency of Services - Resident vs. Management Perceptions

The understanding of management as compared with that of residents with respect to the frequency of regular trash collection services shows that 16 percent of the single family residents (the only respondents queried about frequency of collection) did not venture an answer about the frequency of collection and the remaining respondents gave answers varying from one to more than five times weekly. The management respondent was unsure of the frequency of collection and did not volunteer an answer.

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

To assess the suitability of the system to the environment residents were asked for their opinions on unpleasant environment effects such as noise, odors, trash spillage causing littering effects, pets, and effects of weather, and littering. Their perceptions are presented below in terms of either apartment or single family homes.

9.1 Environmental Impacts Perceived by Apartment Dwellers

Nineteen percent (8) of the 50 respondents living in apartments report that their present form of waste disposal does not afford adequate protection from environmental concerns. Although resident responses indicate that dissatisfaction with the adequacy of the waste disposal system at this site is not a function of tenure, the responses indicate a higher degree of dissatisfaction among low rise residents than among medium rise apartment dwellers (24 percent vs. 8 percent).

Inadequate protection from dogs is the most frequently mentioned deficiency of the multi-family units (6 out of 13 complaints; dog complaints are made only by MFLR residents.

An almost equally important deficiency (five out of thirteen mentions) was odor from the trash facilities; this problem affects MFLR and MFMR units. Insects and weather each received one mention as a cause of inadequacy.

Forty-two of the 50 multiple family unit respondents report that the system is adequate.

The majority of complaints (ten out of thirteen) come from two adult and childless homes. Eleven of the thirteen complaints are made by MFLR residents. Eight of the thirteen complaints (62 percent) come from residents with a tenure shorter than nine months.

The reasons given as systemic inadequacies are "too few containers" (five mentions out of eleven complaints), and poor "cleanliness" (two out of eleven complaints). The cleanliness complaints are from MFMR residents. The other complaints all come from MFLR residents. Awareness of systemic inadequacies is not affected by tenure.

9.2 Environmental Impacts Perceived by Single Family Home Dwellers

Sixty-six percent of the respondents living in single family units find their waste storage containers inadequate. This is over three times the percentage of multi-family unit residents expressing comparable dissatisfaction. Further, almost half of the complaints (48 percent) are made by residents whose tenure exceeds 18 months. Most of the complaints (40 out of 45) come from residents of SFA units. This reflects, among other things, the low number (7) of SFD units in the sample. Of the seven SFD units, however, five voice dissatisfaction with the effectiveness of the waste storage containers.

A large concentration of complaints (30 out of 45) come from homes occupied by two adults each. The complaints are evenly distributed throughout childless units and those with children. Almost half (22 out of 45) of the complainants fill their in-home storage containers daily. Forty-two of 89 specific types of problems mentioned deal with the vulnerability of the system to household pets. Weather (29 mentions), odors (11 mentions), insects (4 mentions), and vermin (3 mentions) also contribute to the ineffectiveness of the external storage containers.

Shortage of containers is a major reason for the complaints (30 mentions out of 33 reasons supplied). Shortage of containers is given primarily by SFA residents (28 mentions out of 33). Forty-two percent of the cited reasons for these problems come from respondents with a tenure greater than 18 months. Households of 2 adults gave 21 of the 33 reasons for the containers ineffectiveness; the reasons given are evenly distributed among childless units and those with children. Fourteen of the reasons were supplied by residents who filled their internal containers daily.

Sixty percent of the respondents from single family units report weekly overloading of their external storage facilities. Twenty-two percent (15) report that overloading is never a problem at the site. Fifty-six percent of the complaints about weekly overloading (23 out of 41) come from respondents with a tenure of over 18 months at the site. Numerically, overloading is greatest in the SFA units; however, all of the SFD units report weekly (6 out of 7) or monthly (1 out of 7) overloading. Sixty-three percent (43 out of 68) of the overloading complaints come from homes of 2 adults. Fifty-nine percent of the overloading is experienced by households having one or two children. Forty-three percent of the overloading complaints come from families who fill their internal storage containers daily.

The major cause of overloading reported is regular household wastes (49 out of 62 instances) followed by bulky items (12 out of 62 instances).

Twenty-nine complaints about waste collection services were reported. The frequency of collection is the most mentioned complaint (19 times) followed by trash spilled by trash collectors (6 mentions). Complaints are voiced mostly (25 out of 29) by SFA residents, respondents from units with two-adults (18 mentions), and from units with two children (12 complaints). Units generating more than four storage cans of trash each week report a significant number of complaints (22).

9.3 Summary of Environmental Impacts Caused by Systemic Inadequacies

Dissatisfaction with the trash collection system is indicated extensively by single family unit residents. Lack of protection of trash from household pets is a problem affecting residents of multiple and single family units.

Problems with overloading of external containers and with frequency of collection are widely reported at this site.

SECTION 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystems. The principal components investigated were:

- trash compactors
- external storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- regularity of service (e.g., trash collections)
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

10.1 Resident Attitudes Toward Suitability of Facilities and Equipment

10.1.1 Trash Compactor

None of the respondents interviewed at this site reported the use of a trash compactor.

10.1.2 External Waste Storage Facility - Single Family Homes

Weekly overloading of the external storage facility is reported by 60 percent (41) of the 68 residents of single family units at this site. Sixty-six percent (45) of the residents of these units find their external storage facilities ineffective. Forty-eight percent of the complaints of ineffectiveness are voiced by residents whose tenure is greater than 18 months. Sixty-one percent of the single family unit respondents with a tenure greater than 18 months find the external waste storage containers inadequate. Two of the three retired respondents report that the external containers are ineffective. Forty-nine out of 89 (55 percent) complaints of container ineffectiveness are expressed by residents who daily fill an internal container. Sixty-six percent (59 out of 89) of the complaints come from households which do not separate their trash. The complaints also come largely from households which generate more than four storage containers of trash weekly (67 percent of the complaints).

The primary reason given (30 out of 33 reasons given) for these container problems is a shortage of cans. This reason is reported primarily by households with non-retired heads (28 out of 33 problem mentions), one adult homes (20 mentions), homes that do not separate trash (22 mentions), households using more than four external storage cans (20 mentions), and residents with a tenure greater than 18 months (14 mentions). All report the shortage of cans as a primary reason for container ineffectiveness.

Overloading, lack of protection of trash from household pets, and a shortage of containers are significant problems for the single family units.

10.1.3 External Waste Disposal Facilities for Apartments

Inadequate waste storage facilities is a problem affecting only MFLR respondents at this site; no problems are reported by MFMR respondents. The problem most frequently mentioned (8 out of 18 problem mentions) is a shortage of containers. Mechanical problems other than chute backups (3 mentions) are cited four times as problems. The trash room's small size, infrequent emptying of the containers, and resident non-use are each cited once as problems. Ten of the complaints come from residents with less than nine months tenure. Seven of the 18 complaints are expressed by residents of units with retired heads of households. The complaints are confined to one (four mentions) and two (14 mentions) adult homes. Households with no children report half of the problems cited. Households filling their in-house containers three times weekly report 13 out of 18 problems.

Only four residents report equipment problems: two residents had trouble with the doors on the trash bins, one resident reported a compactor problem, and one, a mechanical problem. Two of the units have retired heads of households. All four were MFLR residents and three of the four have a tenure of less than nine months. The fourth has resided at this site longer than 13 months.

Eight respondents find the trash storage facilities inadequate environmentally. Susceptibility of the containers to household pets (six mentions), odors (five mentions), insects and weather (one mention each) are problems. Nine of the 24 problems cited are reported by units with retired heads of households. Eleven of the problem mentions come from MFLR residents.

The environmental problems are concentrated in one adult (three mentions) and two adult dwellings (ten mentions). Ten of the problem mentions are from childless homes; the remaining three come from one-child households. Homes filling internal container once weekly are the source of two problem mentions. Households filling internal containers three times weekly report seven problems. Units with daily internal container fill-ups cite nine problems. Eight of the thirteen problem citations come from residents with a tenure of fewer than nine months.

The reasons for the environmental problems reported are "too few containers" (five mentions), "misfitting covers" (four mentions), and "unclean cans" (two mentions). Over half (six out of eleven) of the reported reasons are from residents who have lived at this site fewer than nine months.

10.2 Attitudes About Movement of Wastes to Disposal/Collection Point

10.2.1 Single Family Home Dwellers

No movement of wastes to a disposal/collection point was reported by any respondent.

10.2.2 Apartment Dwellers

Virtually every apartment dweller (with the exception of one MFMR resident) reports some movement of waste to a storage/disposal area. Forty-one percent of the respondents report moving their wastes 10-25 feet to a disposal/collection point. Also 41 percent report moving their trash 50 to over 100 feet to such a point. This latter figure includes 46 percent of the respondents from units with retired heads of households.

Only two residents (both from MFLR units) report possible dangers in this movement, One saw dangers from the weather, another felt the threat of physical disability. Both are from units with retired heads of households. One has lived at this site longer than seven months; the other resident's tenure is greater than 18 months.

10.3 Complaints about Waste Collection Services

Residents of single-family homes, both SFA and SFD were specifically queried about the adequacy of the waste collection service which is provided by the municipal government. Apartment dwellers normally have little and infrequent contact with waste collection as, in essence, their contact with the system stops after they place their trash in the chute. Thus, apartment dwellers were not asked for their opinions in this area.

Sixty-three percent of the respondents of single family respondents have no complaints about the waste collection at this site.

The complaints which were made were:

- Frequency of collection - 19 mentions, one from an SFD unit, 18 from SFA units
- Trash spillage - six mentions, 1 from an SFD unit, five from SFA units
- Unemptied cans - one mention from SFD and SFA units each
- Mishandled trash can - one SFD complainant
- Missed stops - one SFA complainant

The tenure of the resident is in our opinion a major indicator of the validity of a complaint. Respondents who have lived at the site for longer periods have more occasion to observe a greater frequency of problem situations. Figure 10 presents the complaint categories in terms of the complainants' tenure.

Type of Complaint	Length of Residency			Total number of complaints
	6 months or less	7 months to 1 year	More than 1 year	
Frequency of Collection	3	4	0	7
Trash Spillage	1	0	5	6
Unemptied Cans	1	0	1	2
Mishandled Cans	0	0	1	1
Missed Stops	0	0	1	1
TOTAL	5	4	8	17

FIGURE 10: TENURE OF COMPLAINANTS

10.4 Resident Attitudes About Problem Resolution

Respondents were asked whom they contact when they encounter a trash collection problem. All but one of the respondents re report they contact the site manager. The one respondent who did not know whom to contact is from an SFA unit with a non-retired head of household; this respondent has lived at this site longer than 18 months. The residents at this site are clearly well-informed about whom to contact for problem resolution.

Nineteen residents (two from SFD units, 16 from SFA units, and one from an MFMR unit) report having encountered trash collection problems. Eleven of the respondents report that the problems are resolved (one from an SFD unit, nine from SFA units, and one from an MFMR unit).

Eight respondents report unresolved collection problems (one from an SFD unit, seven from SFA units). One unit with a retired head of household reported a resolved problem; one unit with a retired head of household reported an unresolved problem.

All eight of the respondents with unresolved problems have tenure at this site in excess of 18 months. The one respondent who did not know who provided collection services reported a resolved collection problem.

It is of some interest that all of the residents who reported unresolved collection problems have been unable to resolve these problems in over 18 months of residence at this site.

11.5 Resident Attitudes Towards the Cost of Collection

None of the residents are aware of what charges are paid - either directly or indirectly through their rent - for trash collection. Thus, residents are not able to respond to questions about the quality of the trash collection services in terms of its cost.

10.6 Resident Awareness of Service Providers and Innovations

Eighty-seven percent of the respondents at this site report correctly that site mangement provides the waste collection services. Only six (out of 61) SFA residents do not know who provides the services; three (out of 50) of the multi-family unit respondents did not know who provides the service. Three MFLR respondents reported incorrectly that local government provides the service.

Sixty-four percent of the residents of this site are unaware of innovative solid waste disposal techniques or equipment in use at the site. However, all 25 MFLR respondents are aware of these innovations.

Awareness of innovation is reported in this manner:

- Dumpsters were mentioned by six SFA respondents
- Trash chutes were mentioned by:
    - 1 SFD respondent
    - 9 SFA respondents
    - 25 MFLR respondents

5

KING COUNTY, WASHINGTON

SECTION 1

CONCLUSIONS

Based on analysis of the data collected from the Lendemain Homeowners Association representative and residents of Lendemain, conclusions on management and resident perceptions and attitudes on the following issues:

- Adequacy of trash storage and collection facilities and services
- Trash and bulky waste storage requirements and practices of residents
- Resident awareness of, and opinions about, the solid waste disposal system operations, costs, and their responsibilities and point of interaction for resolving problems
- Suitability of the system to the environment.

1.1 Conclusions About the Homeowners Association Attitudes and Impressions

The Homeowners Association Interview was conducted on January 20, 1975. The Homeowners Association representative expressed no overall opinion about the suitability of the system, the extent of resident problems, or the degree of resident cooperation. The Homeowners Association appears quite distant from the waste collection system, deferring all responsibilities to the residents and the private contract hauler. From that vantage point, the Homeowners Association reported no resident complaints, equipment problems, or any interaction with the waste removal system.

1.2 Conclusions About the Residents Requirements, Attitudes and Opinions

Lendemain has three housing types and varied waste disposal patterns and problems. Most of the respondents (80 percent) use grocery bags to store their in-house trash. A small group (16 percent) uses plastic trash bags, with or without storage cans. The most common items stored in these in-house containers, in order of frequency, are paper and packaging, plastic items, cardboard, glass bottles, cans, food wastes, magazines, newspapers and disposable diapers.

A large number (95 percent) of the residents separate large bulky items from regular wastes. These residents arrange for the removal of these bulky items from a variety of sources. Only four percent of the residents regularly separate other items from their trash.

Twenty eight percent of the residents feel that disposal services and facilities are inadequate. Among the most frequently mentioned problems are trash can overloading, a shortage of trash cans, scattering of garbage by household pets, and odors.

The major deficiency at this site appears to be the provision of waste collection services. Respondents report a number of problems with the service provider ranging from rude personnel to uncollected items. Further, the respondents report a lack of responsiveness to their complaints evidenced by a lack of resolution of the difficulties they have brought to the contractor's attention.

SECTION 2

RECOMMENDATIONS

Based on the conclusions, recommendations are warranted to:

- Involve the Homeowners Association in monitoring the waste disposal system
- Improve waste collection services

2.1 Involvement of the Homeowners Association in Monitoring the Waste Disposal System

The Lendemain Homeowners Association does not have personnel directly active in the solid waste management system. Seventy four percent of the respondents reportedly see the contractor as the person to be contacted for problem resolution. However, over half of the residents who have experienced problems with waste collection services and who have contacted the contractor have not had their problem resolved.

By keeping an active file of resident complaints and contact with the contractor, the Homeowners Association personnel might be able to concentrate complaints and influence the contractor to resolve the problems.

2.2 Improvement of Waste Collection Services

Complaints about the quality of waste collection services covered all the survey categories for complaints including rude sanitation personnel, damage to trash containers, uncollected items, pick up on the wrong days, noisy personnel and equipment, and trash spillage. The dissatisfactions and the number of unresolved complaints (see above) indicate that the problems of waste collection at this site assume significant proportions.

Efforts should be made to aggregate and focus resident complaints through constructive but forceful dialog with the contractor.

SECTION 3

PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

3.1 Size and Location of Site

The King County Operation Breakthrough Site consists of 35.9 acres. Driving time to the Central Business District of Seattle is 40 minutes.

3.2 Land Characteristics

The site is gently rolling and heavily wooded. It is bounded on the west by recently built single family detached residents on the west and east and a community park and vacant land to the north on which an elementary and a middle school are planned. A shopping center and garden appartments are planned to border the project on the southeast.

3.3 Description of the Site

The site contains 178 units of varied density building types which are characterized as single family attached, single family detached, and multi-family low rise structures. The overall density of the site is 5 units per acre. Through application of the clustering approach much of the existing heavily wooded character of the site is preserved. A ring road provides the major access to each cluster of detached houses, townhouses, and condominiums. The clustering approach also provides active and passive recreational areas which are accessible to each housing cluster.

SECTION 4

CHARACTERISTICS OF SITE HOUSING

A discussion of the housing on the site is presented in this section. The focus is on number and type of housing rather than on the physical and/or architectural characteristics. The occupancy level, length of occupancy, and housing costs are discussed.

4.1 Types and Numbers of Housing Units

Three different types of housing exist at Lendemain: single-family detached (SFD), single-family attached (SFA), and multi-family low rise (MFLR) (units four stories or less). The largest group is 84 SFD 2, 3, 4, or 5 bedroom homes. There are 70 SFA 2, 3, or 4 bedroom homes. There are 24 MFLR 1 or 2 bedroom homes in 3 buildings.

In total there are 178 units. Of these, 97 are included in our sample for the resident survey. All data which are presented are derived from the sample which was stratified by housing type as follows:

• Single family detached	46 units
• Single family attached	38 units
• Multi family low rise	13 units

4.2 Ownership and Occupancy

The Homeowners Association representative was interviewed on January 20, 1975. The Homeowners Association representative reported that all units were fully (100 percent) occupied. All units are individually owned.

Housing Type	Number of Bedrooms	Sales Price Range
SFA	2 to 4	$16,500 to $33,500
SFD	2 to 5	$21,000 to $32,000
MFLR	1 and 2	$16,500 to $33,500

FIGURE 1: SALES PRICE RANGES BY HOUSING TYPE

The length of occupancy (tenure) is an important characteristic to note as it provides a baseline of resident experience against which to measure attitudes and perceptions about the site and the solid waste disposal system. Tenure ranges from less than 3 months to more than 18 months across the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	Dwelling Type								No. and % by tenure	
	SFD		SFA		MFLR		MFMR			
	No.	%	No.	%	No.	%	No.	%	Total	%
Less than 3	1	2	5	13	1	8	-	-	7	7
4 to 6	7	15	8	21	2	15	-	-	17	16
7 to 9	6	13	4	11	0	0	-	-	10	10
10 to 12	4	9	7	18	2	15	-	-	13	13
13 to 18	6	13	4	11	4	31	-	-	14	14
More than 18	22	48	10	26	4	31	-	-	36	40
Total	46	100%	38	100%	13	100%	-	100%	97	100%
Average Tenure	14.3 months		11.2 months		12.5 months		- months			
Median Tenure	17 months		11.6 months		14.2 months		- months			

FIGURE 2: TENURE OF RESIDENTS BY DWELLING TYPE

SECTION 5

RESIDENT CHARACTERISTICS

The characteristics of Lendemain residents are presented in terms of: retirement status, number of adults, and number of children. Other types of demographic data were not collected in the survey.

5.1 Retirement Status of Household Heads

Eight of the 97 household heads are retired; five live in MFLR units, two live in SFA units, and one resides in an SFD unit. The average residency tenure of the retired respondents is 15.9 months.

5.2 Number of Adults and Children

For the 97 units, population data are specifically categorized by the number of adult and child residents per unit as follows:

- Adults
  - 1
  - 2
  - 3
  - 4 or more
- Children
  - 0
  - 1
  - 2
  - 3
  - 4 or more

Use of this type of categorization limits the precision of population data to minimum numbers of adults and children. It is not possible to state that a specific number of persons live in the 97 sampled units. It is possible to say that at least 191 adults and 97 children reside in the sampled units, and that 3 such units contained 4 or more adults and 5 units contained 4 or more children. Forty-seven units have no children.

5.2.1 Adults and Children in Single Family Detached Homes

At least 97 adults and 57 children, a total of at least 154 persons, reside in the 46 single family detached units included in our sample. One SFD unit reports 4 or more adults and 3 SFD units repor 4 or more children. There are 15 SFD units which report no children. Figure 3, below, presents the adult and children populations of SFD units as well as the frequency of SFD units by number of adults and children per unit.

Number of Adults Per Unit	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number Of Units	Number of Adults		Number Of Units	Number of Children	
0	--	--	0	15	0	9
1	0	0	1	14	14	14
2	42	84	2	11	22	106
3	3	9	3	3	9	18
4 or more	1	≥4	4 or more	3	≥12	≥16
TOTAL	46	≥97	TOTAL	46	≥57	≥154

FIGURE 3: POPULATION OF SFD UNITS

5.2.2 Adults and Children in Single Family Attached Homes

A total of at least 111 persons reside in the 38 single family attached homes sampled. At least 74 are adults and at least 37 are children. Two respondents each report that 4 or more children reside with them. Figure 4 presents the adult and children population of SFA homes along with the frequency of SFA units by numbers of adults and children per unit.

Number of Adults Per Unit	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number Of Units	Number of Adults		Number Of Units	Number of Children	
0	--	--	0	17	0	0
1	9	9	1	11	11	20
2	24	48	2	6	12	60
3	3	9	3	2	6	15
4 or more	2	≥ 8	4 or more	2	≥ 8	≥16
TOTAL	38	≥74	TOTAL	38	≥37	≥111

FIGURE 4: POPULATION OF SFA UNITS

5.2.3 Adults and Children in Multi-Family Units

Exact population responses were obtained for all 13 MFLR units surveyed. Twenty-three persons lived in the MFLR units, of whom 20 were adults.

Figure 5 displays data on the population of adults and children in the MFLR units.

Number of Adults Per Unit	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number Of Units	Number of Adults		Number Of Units	Number of Children	
0	--	--	0	10	0	0
1	6	6	1	3	3	9
2	7	14	2	0	0	14
3	0	0	3	0	0	0
4 or more	0	0	4 or more	0	0	0
TOTAL	13	20	TOTAL	13	3	23

FIGURE 5: POPULATION OF MULTI-FAMILY HOUSING

SECTION 6

SUMMARY OF THE HOMEOWNERS ASSOCIATION REPRESENTATIVE'S PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of the Homeowners Association representative's understanding of the extent of solid waste disposal collection facilities and services, of expected resident practices in storing and disposing solid wastes, of regulations governing resident storage and disposal actions, of use of facilities and services, of limitations, of services, and of charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and compaction of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilities. The discussion which follows presents the application of such facilities and services for each type of housing.

6.1.1 Single Family Homes

Both SFD and SFA residents are expected to provide and maintain their own internal and external storage facilities. Residents must use 32-gallon containers and place their trash curbside for collection by a private contract hauler pick-up once a week. They are permitted two containers or plastic bags before additional pick-up charges are imposed.

Disposal of yard wastes is, as is yard maintenance, the responsibility of each resident.

6.1.2 Multi-Family Low Rise Units

MFLR units are provided with dumpsters for outdoor storage of trash. These dumpsters are emptied once a week by a private contract hauler.

Yard maintenance, and the removal of wastes therefrom, is provided by the Homeowners Association through a yard service contractor.

6.2 Expected Resident Storage and Disposal Practices.

Residents of single family homes are expected to store their trash in containers (two standard 32-gallon garbage cans or equivalent) and place it curbside for collection. MFLR residents are expected to carry their trash to one of the dumpsters for collection.

The Homeowners Association has made no specific provision for the removal of large or small bulky wastes.

6.3 Site Rules and Regulations

The Homeowners Association has prepared and published rules governing the operation of the solid waste disposal system. The major regulation was that SFD and SFA residents use 32-gallon containers to dispose of trash.

6.4 Limitations on Disposal Volume and Service Charges

Simply stated there is a 32-gallon limitation on the amount of household trash which a single family or multi-family resident can dispose of during any specific period.

Residents are billed and pay directly to the private contract haulter.

SECTION 7

RESIDENT'S SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains all the data describing the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- External solid waste storage practices (single family houses)
- Location of disposal site (apartments)

7.1 Disposal of Bulky Wastes

The principal issues regarding bulky waste disposal and collection practices are:

- Homeowners Association or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for large and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

Although the published rules and regulations for waste removal were not available to our interviewer, we were able to determine the content of these regulations. Essentially SFD and SFA residents are required to use 32-gallon containers and place their trash curbside for collection. MFLR residents carry their trash to one of several dumpsters for collection.

7.1.2 Placement of Large and Small Bulky Wastes

Small bulky wastes include yard wastes, small appliances, and bulky cardboard items. Large bulky wastes include such items as furniture and discarded major appliances.

Of the 97 respondents at the site, 95 percent (92) indicate that they separate large bulky items from the regular trash while 46 percent (45) separate small bulky items from their regular household trash.

Forty-one percent (19) of the SFD respondents separate small bulky items from their regular trash. Sixty-six percent (25) of the SFA and 8 percent (1) of the MFLR residents separate small bulky items from their regular trash.

7.1.3 Responsibility for Bulky Waste Collection

The responsibility for the removal of bulky wastes rests entirely upon each resident. The respondents indicate a variety of available sources for bulky waste collection. Eleven percent (11) of the respondents do not know where to obtain removal services for small bulky items; for large items the figure is 16 percent (16). Alternatives mentioned for the provision of removal services for small bulky items include local government (4 mentions), management (1 mention), transporting trash to a local dump (46 mentions), and private collection services (35 mentions). Figure 6 presents data on respondent understanding of bulky waste removal responsibility.

	Small Items	Large Items
Local Government	4%	2%
Management	1%	0%
Taken to Dump	48%	44%
Private Collection Service	36%	38%
Don't Know	11%	16%
TOTAL	100%	100%

FIGURE 6: RESIDENT UNDERSTANDING OF BULKY WASTES DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

Bulky wastes are disposed by collection in the regular trash pick-up, collection by "special" pick-up, and pick-up requested by the homeowner.

Thirty-six percent of the single family unit indicate that small bulky items are collected with their regular trash. Ninety-two percent of the MFLR respondents report that the small bulky items are collected with their regular trash.

Thirty percent (25 out of 84) of the single family unit respondents report that large bulky items are removed with their regular trash; for MFLR respondents the figure is 92 percent.

Forty-two percent of the single family unit respondents said they do not know how to have large bulky items removed. Only 1 of the 13 MFLR respondents does not know how to arrange for the pick-up of a large bulky item.

7.2 Separation of Waste

There are no site rules which require residents to separate bulky wastes, glass, plastics, newspapers, food wastes, or other items before collection. Small bulky wastes are separated from the regular trash 46 percent of the time while large items are separated from the regular trash 95 percent of the time.

Figure 7, presents the respondents frequency, in number of cases and by percentage, for waste separation in each trash category. Most residents (96 percent) do not separate their household trash.

Resident Action and Items	Percentage of Residents	Number of Cases
Separate Household Trash Items:	0%	0
Glass	1%	1
Bulky Wastes	3%	3
Plastics	0%	0
Food Wastes	0%	0
Newspapers and Magazines	1%	1
Other - Cans	1%	1
Frequency of Trash Separation	4%	4
Frequency of Non-Separation	96%	93
TOTAL	100%	97

FIGURE 7: EXTENT OF RESIDENT TRASH SEPARATION

7.3 In-Home Solid Waste Storage

The primary in-home solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined cans, and other unspecified types.

Only about 16 percent of the respondents report using plastic bags for in-house storage while 80 percent of the respondents use grocery bags for that purpose. Two percent of the respondents use unlined cans for the internal storage of solid wastes. No respondent reports the use of a trash compactor.

Respondents store the following items in their in-house containers: paper, packing, glass bottles, plastic items, cardboard, newspapers, food wastes, and miscellaneous items such as disposable diapers and cans.

Figure 8 presents the number and percentages of respondents who reported the types of waste they store in their in-house containers.

Type of Waste	No. of Responses [1]	% of Responses
Paper/Packaging	88	91%
Glass Bottles	70	72
Plastic Items	87	90
Cardboard	83	86
Newspapers	22	23
Magazines	23	24
Food Wastes	27	28
Other: Cans	57	59
Disposable Diapers	1	1

[1] Out of a total of 97 units surveyed

FIGURE 8: TYPE OF WASTES STORED IN IN-HOUSE CONTAINERS

Respondents from all housing types fill their in-house containers an average of 3 times weekly. A substantial number of respondents report daily or more frequent filling of their in-house containers. Figure 9 presents additional data on the respondents in-house container filling practices.

In-House Storage Fill-Up Characteristics	HOUSING TYPES		
	SFD	SFA	MFLR
Average number of fill-ups per week	3.2	3	2.8
Number and percent reporting three or more fill-ups per week	35 of 46 (76%)	29 of 38 (76%)	10 of 13 (77%)
Number and percent reporting daily or more than daily fill-up	19 of 46 (41%)	9 of 38 (24%)	2 of 13 (15%)

FIGURE 9: FREQUENCY OF FILL-UP IN-HOME STORAGE CAPACITY, BY HOUSING TYPE

7.3.2 Use of Trash Compactors

None of the respondents use a household trash compactor.

7.4 External Solid Waste Disposal Practices

The practices for storage and disposal of solid wastes outside the home are related to the type of housing unit. For single family homes, solid wastes in excess of the in-home storage capacity must be placed outside the interior living space until the exterior container is filled. The apartment dwellers excess storage is provided outside by the dumpster containers.

7.4.1 External Storage - Single Family Residents

Respondents use three types of external storage containers: metal cans, plastic cans and plastic bags. The trash is stored in plastic bags and metal and plastic cans outside their house for collection by a contract hauler.

Single family respondents in detached homes fill an average of 1.6 cans weekly while SFA respondents fill 1.7 cans weekly. Seventy-one percent of the single family residents report limitations on the volume of trash collected by the hauler.

7.4.2 External Storage - Apartment Residents

All of the MFLR respondents carry their household wastes to one of several dumpsters near the buildings. Twenty-three percent (3 of 13) of the respondents carry their trash from 50 to 100 feet to a dumpster; 77 percent must carry their trash over 100 feet to a dumpster. The average distance each respondent must carry his trash to a dumpster is 128 feet.

SECTION 8

RESIDENTS' UNDERSTANDING OF THEIR RESPONSIBILITIES COSTS AND FREQUENCY OF SERVICES

This report section covers quantitative and qualitative data from interviews with site management personnel and residents.

8.1 Responsibility for Solid Waste Collection

The property management respondent stated that yard maintenance for all single family dwellings at this site is the responsibility of each resident. The responsibility includes the removal of all yard wastes. The management respondent reports that resident requests for special collection services are directed, by each resident, to a private contractor.

In view of the resident's responsibility for waste removal, the diversity of responses cited as sources for bulky waste removal is probably indicative of resident resourcefulness in this area.

Local government is viewed as a source for removal of small bulky items by 4 (out of 97) residents and of large bulky items by one resident. One resident indicates management as a provider of removal services for small bulky items. A substantial number of residents take their own bulky wastes to a dump for disposal. Forty-seven percent (46 of 97) of the respondents take small bulky items to a dump; 44 percent of the respondents take large bulky items to a dump. Thirty-six percent (35) of the respondents rely on a private collection service for the removal of small bulky items; 38 percent (37) rely on a private collector for disposal of large bulky items. Sixteen of the respondents (17 percent) do not know how to arrange for the removal of a large bulky item; 11 percent do not know how to have a small bulky item removed.

Generally, the numbers of respondents unaware of providers of bulky item removal are small; knowledgeable residents indicate awareness of a variety of sources for that service.

8.2.1 Resident Awareness of Type of Charges

Twenty-eight percent (27 of 97) of the respondents report additional charges for the removal of small bulky items; 28 percent report no additional charges for that service. The remaining 30 respondents do not know if there are additional charges for the service. Forty-six percent of the respondents do not know if there are extra charges for the removal of large bulky items; only 10 percent (10 out of 97) report additional charges for large bulky item removal.

Three one-time charges (.50, $1.00, and $3.00) were reported by residents as fees paid for the collection of small waste items. A one-time pick-up fee of $1.50 was paid by one respondent for the removal of a large bulky item.

Charges of $.50 (11 respondents), $.75 (3 respondents), and $1.00 (4 respondents) are reported as additional fees per can above a 2 can minimum for regular trash collection.

All 13 MFLR respondents report that waste collection service payments are not made directly to the private contractor. Six of the 84 single family unit respondents do not know that there are charges for the collection of their regular wastes. Twenty-five percent of the respondents think the collection costs are "too high" while about 40 percent (38 respondents) think the costs are "about right."

8.3 Frequency of Services - Resident vs. Management Perceptions

This section compares management and resident perceptions of the frequency of regular trash collection services.

8.3.1 Single Family Homes

Seventy-Six of the 77 single family unit respondents report weekly trash collection as did the management respondent. One

SFD resident, however, thinks trash is collected twice weekly.

Seventy-one percent (60) of the single family unit respondents are aware of limitations on the volume of trash collected in the regular pick-up. All of the respondents specifying a limitation (52) stated that they are limited to 2 cans per pick-up. Any number of cans above this limit is subject to additional charges.

Seventy percent of the respondents report that external storage can overloading is a problem. Only 11 respondents report that weekly overloading is never a problem. The most frequently mentioned cause of these problems is household trash (19 out of 26 causes cited). Yard wastes (4 mentions) and bulky items (3 mentions) are cited as other causes for overloading.

8.3.2 Apartments

Trash is collected weekly from the dumpsters used by MFLR residents at this site. Eleven of the 13 MFLR respondents indicate that the facilities are adequate. The lack of containers and small size of the trash area are the only two complaints.

Generally the trash collection arrangements for multi-family unit dwellers are adequate. However, overloading is of major concern to single family unit residents.

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

To assess the suitability of the system to the environment, respondents were asked for their opinions on unpleasant environmental effects such as odors, trash spillage causing littering effects, pests (insects and vermin), nuisances caused by household pets, effects of weather causing flooding in trash storage areas, and littering. Their perceptions are presented below.

9.1 Environmental Impacts Perceived by Apartment Dwellers

Five of the 13 MFLR respondents at this site report that the present form of waste disposal does not afford adequate protection from environmental concerns. All of the complainants have lived at this site longer than a year.

Inadequate protection from household pets (3 complaints), odor and weather (2 complaints each), and insects (1 complaint) are some of the reasons given for the environmental inadequacies.

The majority (11 out of 13) of the respondents gave no reasons for the system inadequacies. However, 2 households (each with only one adult and no children) report reasons. One respondent complains of a shortage of containers. There were no complaints about the collection service.

9.2 Environmental Impacts Perceived by Single Family Home Dwellers

Twenty-seven percent of the single family unit dwellers feel that their disposal system is inadequate. Dissatisfaction appears related to tenure as 15 of the 22 dissatisfied respondents have a tenure at this site of more than 10 months.

Sixty-eight percent (15 out of 22) of the SFA respondents report the system environmentally inadequate compared to 19 percent (7 out of 37) of the SFD respondents. The reports of environmental inadequacy come primarily from 2 adult homes (15 out of 22 complaints) and 1 or 2 children units (13 out of 22 complaints). Eighty-six percent (19) of the complaints come from units that fill internal containers three or more times per week.

As did MFLR respondents, single family home respondents cite vulnerability to household pets as the greatest deficiency in the waste disposal system (19 mentions). The susceptibility to weather (7 mentions), odors (4 mentions) and insects (1 mention) also contributed to the environmental inadequacy of the system.

The major reason given (11 mentions) for these inadequacies is misfitting covers; however, a fairly significant number of respondents (9) do not know a reason for the inadequacy. Missing covers and a shortage of trash cans each received one mention as a source of the inadequacies.

Seventy percent of the single family unit respondents report weekly overloading of their external trash cans. This problem seems to increase with tenure as 54 percent of the overloading is experienced by residents with a tenure exceeding one year.

The problem of weekly overloading is greatest at SFD units (32 out of 37 respondents). The highest rate of weekly overloading (78 percent of the overloading) is reported by two adult homes and childless (24 instances) units. Seventy-five percent of weekly overloading is reported by units filling in-house containers three or more times per week. Regular household trash is mentioned most often as the cause of weekly overloading (19 out of 26 mentions) followed by yard wastes (4 mentions) and bulky items (3 mentions).

Half of the single family unit respondents complained about the collection service. The most frequently mentioned complaints are uncollected items (10 mentions), spilled trash and damaged cans (8 mentions each). Complaints seem to increase with tenure. Over half of the complaints are from SFA units. Forty of the 42 complaints are from non-retired heads of households. Two adult homes (31 out of 42 complaints) and 1 or 2 children homes (19 complaints) voice a substantial number of complaints about the waste collection services. Thirty-eight of the complaints are from homes using 1 or 2 storage containers weekly.

9.3 Summary of Environmental Impacts Caused by Systemic Inadequacies

Although environmental concerns plague residents of multiple and single family units at this site, the greatest impact of these concerns is on residents of single family dwellings. Lack of protection of trash from household pets is the most frequently expressed deficiency of disposal facilities at single and multiple family dwellings.

The environmental problems, especially for single family dwelling residents, increase with resident tenure. The majority of all site residents view the trash storage and collection system as environmentally inadequate.

SECTION 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystems. The principal components investigated were:

- trash compactors
- external storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- regularity of service (e.g., trash collections)
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

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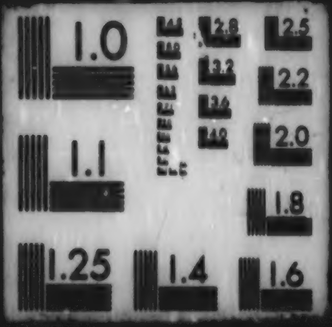
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10.1 Resident Attitudes Toward Suitability of Facilities and Equipment

10.1.1 Trash Compactor

No in-home trash compactor is in use at this site.

10.1.2 External Waste Storage Facility - Single Family Homes

Seventy percent (59 out of 84) of the respondents of single family homes report weekly overloading. Only 13 percent stated that overloading is never a problem. Eighty-one of the single family respondents respond to questions about the effectiveness of waste storage containers. Of that number, 27 percent (22) find the waste storage containers inadequate. Respondent problems with inadequate storage containers increase with tenure at this site. Four out of six (67 percent) of the respondents who had lived at this site fewer than 3 months report inadequate storage containers . Eighty-seven percent (27 out of 31) of the respondents who had lived at this site longer than 18 months report inadequate storage facilities.

The 59 single family unit respondents reporting inadequate storage containers cite problems affecting container adequacy. Among these problems are: vulnerability to household pets (cited by 32 percent of the single family unit respondents), wether (7 mentions), odors (4 mentions), and insections (1 mention). The largest concentration of these problems is in the 2 adult homes (22 of 31 problems cited) and 1 and 2 children units (21 of 31). Problem mentions are distributed throughout the groups of respondent tenure.

Problems are encountered most frequently by households which use 1 or 2 storage cans weekly (30 of 31 mentions). Twenty-six of the 31 problem mentions (84 percent) come from households filling internal containers three or more times weekly.

Reasons given for these problems include "misfitting covers"(11 mentions), "missing covers" and "too few cans" (1 mention each).

Overloading is a significant problem for single family unit respondents. The problems encountered increase with tenure at the site.

10.1.3 External Waste Disposal Facilities - Apartments

Eighty-five percent (11 out of 13) of the MFLR respondents find the external waste disposal facilities adequate. "Too few containers" and the small size of the trash storage area are each mentioned once as inadequacies. The inadequacies are reported by the retired occupants of one adult, childless households. One had lived at the site less than one year; the other's tenure was less than 18 months. Each fill about one external storage can a week.

Eleven out of 13 respondents report equipment problems. The dumpster lid has caused problems for 10 of the respondents and an unspecified mechanical problem has been encountered by one respondent. The 11 problems are all encountered by 1 and 2 adult households with 1 or no children. The problems are most apparent (6 mentions) in households filling an internal container three times each week. Six of the problem mentions are reported by respondents whose tenure exceeds one year at the site.

Five of 13 MFLR respondents cite environmental inadequacies in the use of external storage containers. Causes of these problems are reported as household pets (3 mentions), odor and weather (2 mentions each), and insects (1 mention). The problems are encountered primarily by 1 or 2 adult homes (8 mentions) and childless units (7 mentions). Households filling their internal containers three times weekly encountered 7 of the 8 reported causes of environmental inadequacy. All of the problems are encountered by residents who have lived at the site longer than one year.

"Misfitting covers" (4 mentions), "too few containers" and "missing lids" (1 mention each) are reasons given for the inadequacy of external storage cans. All of the respondents citing these problems have lived at this site longer than one year.

10.2 Attitudes About Movement of Wastes to Disposal/Collection Point

10.2.1 Single Family Home Dwellers

Seventy-one percent (60 out of 84) of the respondents report moving their external container to curbside. This move is less than 50 feet for 61 percent of the respondents. Sixteen of the respondents report no movement of their cans, apparently leaving the cans curbside between trash collections.

Only three respondents report danger in the movement of trash and that danger is exposure to weather. Two of the fears are expressed by SFD residents, one by an SFA resident. All have tenure of less than 9 months and none are retired.

10.2.2 MFLR Residents

Ten of the 13 MFLR respondents reported moving their internal containers about 100 feet to the dumpsters. The average distance each MFLR resident carries his container to the dumpster is 128.4 feet. Five of the respondents are retired and carry their containers an average of 115 feet to a dumpster. None of the MFLR respondents report any dangers in the movement of trash from the dwelling unit to the dumpster.

10.3 Complaints About Waste Collection Services

Residents of single family homes were specifically asked about the adequacy of the waste collection service provided by the contract hauler. MFLR dwellers normally have little and infrequent contact with waste collection as, in essence, their contact with the system stops after they have placed their trash in the dumpster.

In sum, the complaints from single family residents covered virtually every category included in the survey.

The tenure of the resident is (in the opinion of the author) the major indicator of the validity of a complaint. Respondents who have lived at the site for longer periods will have more occasion to observe a greater frequency of problem situations. Overall, many of the complaints which are registered are made by residents with more than one year's tenure. Figure 10 presents the complaint categories in terms of the complainant's period of tenure.

Type of Complaint	Length of Residency			
	6 months or less	7 months up to one year	More than one year	Total Number Complai
Cans unemptied	3	0	3	6
Disturbance:				
Noisy trucks	2	1	1	4
Can Handling	3	0	1	4
Noisy Personnel	0	0	1	1
Noisy Equipment	1	0	2	3
Rudeness	1	1	1	3
Missed Stops	3	2	2	7
Wrong Days	0	0	1	1
Trash Spilled	2	4	2	8
Cans Damaged	4	0	4	8
Uncollected Items	3	1	11	15
TOTAL	22	9	29	60

FIGURE 10: TENURE OF COMPLAINANTS

10.4 Attitudes About Problem Resolution

Respondents were asked whom they would contact if they encountered a trash collection problem. Seventy-four percent indicate they would contact the private contractor responsible for trash collection. Eleven percent (11, of whom 10 were MFLR residents) indicate that they would contact the Homeowner Association representative. Two respondents would contact the county government even though it is not involved with the collection of this site.

Of the 35 respondents reporting having had problems with trash collection, 22 had their problems solved. Nine of the residents having trash collection problems live in MFLR units and none of the problems have been resolved.

Overall, the single family unit respondents have much greater success in the resolution of trash collection problems than those in MFLR units.

10.5 Resident Attitudes About the Cost of Collections

Forty-eight percent of the respondents feel that their collection costs are "about right" or inexpensive. The highest degree of satisfaction is expressed by SFA respondents. No retired person felt the charges were too high. Sixty-two percent of the respondents who correctly identified the collection service provider are satisfied with the fees for that service.

10.6 Resident Awareness of Service Providers and Innovations

The relatively low level of MFLR respondent involvement with the trash collection system is reflected in the incorrect identification of the service provider by single family unit respondents.

Eighty-seven percent of the single family unit respondents correctly identified the provider of collection services as a private contractor.

Resident awareness of innovations in use at the site are fairly low. Eighty-four percent of the respondents said they are unaware of any innovations in use at the site. The question was asked of them in a way which would not bias their awareness so that the responses would be valid. If they answered that they are not aware of innovations, then identification of the innovations was not requested. In short, no prompting or extensive probing of respondents was attempted to ensure that their awareness was self-induced.

Analyzing this resident awareness of innovation we found:

- Dumpsters - mentioned by 1 SFD, 2 SFA and 7 MFLR residents
- Compactors - mentioned by 2 SFD and 1 SFA resident

No compactors are used at this site.

6

MACON, GEORGIA

SECTION 1

CONCLUSIONS

The analysis of the data collected from the site manager and residents of Crystal Lake resulted in conclusions on management and resident perceptions and attitudes on the following issues:

- Adequacy of trash storage and collection facilities and services.
- Trash and bulky waste storage requirements and practices of residents.
- Resident awareness of, and opinions about, solid waste disposal system operations, costs, and their responsibilities and point of interaction for resolving problems.
- Suitability of the system to the environment.

1.1 Conclusions About the Site Management's Attitudes and Impressions

The Site Management Interview was conducted on January 20, 1975. The site management representative expressed no overall opinion about the suitability of the waste disposal system or the extent of resident problems. Site management gave no indication of the cost or environmental suitability of the system. Management personnel are, however, involved with many aspects of the system's operation (cleaning and disinfecting containers, for example) and they also maintain a file of resident complaints.

1.2 Conclusions About the Residents' Requirements, Attitudes, and Opinions

Crystal Lake has four housing types and varied waste disposal patterns and problems. Most of the respondents (67 percent) use grocery bags, at some time, for in-house storage of trash. However, 42 percent of the respondents use plastic bags for this purpose. Two respondents use in-house trash compactors.

The most common items stored in these in-house containers, in order of frequency, are paper and packaging, plastic items, glass bottles, cardboard, newspapers, magazines, and food wastes.

All of the respondents separate large bulky items from their regular household trash and 48 percent separate small bulky items from their regular trash. Only 12 percent of the respondents separate out other items (glass, food wastes, etc.) from their trash.

Over one-third of the respondents find the trash system inadequate. Environmental inadequacies they cite include odors, insects, weather and pet scattering of garbage and vermin.

SECTION 2

RECOMMENDATION

Based on the conclusions reached, a recommendation is warranted t

- Alleviate reported environmental inadequacies of the disposal system.

A substantial number of respondents at this site report environmental problems resulting from residents' failure to maintain properly covered containers. It is probable that resident compliance with this practice would decrease the incidents of weather and pet scattering of garbage, and would lessen the odor and insect problems of which the respondents complain.

An active campaign by site management should be begun to bring all of the residents into compliance with this practice.

SECTION 3

PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

3.1 Size and Location of Site

The Macon Operation Breakthrough Site consists of 50 acres. The site is location 4 miles from Macon's Central Business District.

3.2 Land Characteristics

The rolling site is densely wooded with pine and hard woods and contains a six acre spring-fed lake.

3.3 Description of Site Layout

The site contains 287 units of varied density building types. These have been characterized as single family attached and multi-family low-rise and high-rise structures.

The cluster approach was used here to minimize the amount of street and length of utility lines needed, to separate pedestrian and vehicular traffic and to link open spaces. A community center facility serves as a nucleus of social activity for the residents. A unifying open space system, incorporating the lake and the community building, will offer a variety of daily recreational activities convenient to the housing clusters.

3.4 Special Environmental Considerations

Two institutions of higher learning are conducting on-going ecological studies at this site. Georgia Tech is studying siltation of the lake, levels of erosion, turbidity and pollution prior to and during construction and after occupancy. Mercer College is doing an analysis of plant and animal life on the site before, during and after construction.

The site was designed within constraints of slopes and natural terrain and construction safeguards were instituted to prevent erosion and excessive run off into the lake.

SECTION 4

CHARACTERISTICS OF SITE HOUSING

In this section a discussion of the characteristics of the site's housing stock is presented. The focus is on amount and type of housing, rather than on the physical and/or architectural housing characteristics. The extent and length of occupancy and housing costs are also discussed here.

4.1 Types and Numbers of Housing Units

There are four different types of housing units present at the site. These are single-family attached (SFA), single-family detached (SFD), multi-family low rise (MFLR) which are four stories or less, and multi-family high rise (MFHR) which are five or more stories.

The largest group are the SFA with 149 units. These are either 2, 3, or 4 bedroom homes. Next in size are the MFHR units which number 80. These are tither 1, 2 or 3 bedroom homes.

There are 42 MFLR units which are either 1, 2 or 3 bedroom types, as well as 16 SFD units which are either 3 or 4 bedroom types.

In total there are 287 units. Of these, 129 were included in our sample for the resident survey. All data which are presented hereafter were derived from our sample which was stratified by housing type as follows:

- Single Family detached - 4 units
- Single Family attached - 70 units
- Multi-family low rise - 19 units
- Multi-family high rise - 36 units

4.2 Ownership and Occupancy

The site manager was interviewed on January 20, 1975. At that time the site manager reported that SFA, SFD, MFLR and MFHR were occupied at a level of 70 percent occupancy. The site manager felt that 92 percent occupancy represented "full occupancy" for all units and hoped to reach this level by the fall.

The site's occupied units are being rented. The rental range for each type of housing is shown below in Figure 1.

Housing Type	Number of Bedrooms	Monthly Rental Range
SFA	2 to 4	$114 to $258
SFD	3 to 4	$114 to $258
MFLR	1 to 3	$117 to $234
MFHR	1 to 3	$117 to $234

FIGURE 1: RENTAL RANGES BY HOUSING TYPE

The length of occupancy (tenure) is an important characteristic to note, as it provides a baseline of resident experience against which to measure attitudes and perceptions about the site and its solid waste disposal system. Tenure ranged from less than 3 months to more than 18 months across the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	Dwelling Type								No. and % by tenure	
	SFD		SFA		MFLR		MFHR			
	No.	%	No.	%	No.	%	No.	%	Total	%
Less than 3	1	25	6	9	2	11	3	8	12	9
4 to 6	0		8	11	1	5	8	22	17	13
7 to 9	0		13	19	2	11	2	7	17	13
10 to 12	0		7	10	1	5	3	8	11	9
13 to 18	2	50	8	11	1	5	3	8	14	11
More than 18	1	25	28	40	12	63	17	47	58	45
Total	4	100%	70	100%	19	100%	36	100%	129	100%
Average Tenure	12.2 months		14.5 months		16.9 months		13.6 months			
Median Tenure	14 months		13.5 months		20.0 months		15.5 months			

FIGURE 2: TENURE OF RESIDENTS BY DWELLING TYPE

SECTION 5

RESIDENT CHARACTERISTICS

This section presents the characteristics of Crystal Lake residents in terms of three factors; retirement status, number of adults and number of children. Other types of demographic data were not collected for this survey.

5.1 Retirement Status of Household Heads

There are 21 retired respondents living at this site. Eleven live in MFHR units, 8 in SFA housing, 1 in SFD and 1 in MFLR units.

5.2 Number of Adults and Children

For the 129 units which were surveyed, population data was collected on adults and children which specifically categorized the number of residents per unit as follows:

- Adults
    - 1
    - 2
    - 3
    - 4 or more
- Children
    - 0
    - 1
    - 2
    - 3
    - 4 or more

Use of this type of categorization usually limits the precision of population data to minimum numbers of adults and children. At least 340 persons reside in the sampled units. Specific population data by housing type are discussed below.

5.2.1 Adults and Children in Single Family Detached Homes

At least 10 adults and 4 children, a total of at least 14 persons reside in the 4 single family detached units included in our sample. SFD units reporting 4 or more adults number 1, and no units report 4 or more children.

Number of Adults per Units	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	2	0	0
1	0	0	1	1	1	1
2	3	6	2	0	0	6
3	0	0	3	1	3	3
4 or more	1	≥4	4 or more	0	0	4
Total	4	≥10	Total	4	4	≥14

FIGURE 3: POPULATION OF SFD UNITS

5.2.2 Adults and Children in Single Family Attached Homes

A total of 193 persons reside in the 70 single family attached homes sampled. Of these, 115 are adults and 78 are children. No respondents report that four or more children reside with them. Figure 4 presents data on the adult and children population of SFA homes.

Number of Adults Per Units	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number of Adults	Number of Adults		Number of Units	Number of Children	
0	--	--	0	15	0	0
1	26	26	1	23	23	49
2	43	86	2	23	46	132
3	1	3	3	3	9	12
4 or more	0	0	4 or more	0	0	0
Total	70	115	Total	70	78	193

FIGURE 4: POPULATION OF SFA UNITS

5.3.3 Adults and Children in Multi-Family Units

Exact population responses are available for all 55 multi-family units surveyed, as no respondent indicates more than four adults or children reside in his apartment. One hundred and thirty-three persons live in the sampled multi-family units with 49 residing in the 19 low rise units and 84 in the 36 medium rise units.

Figures 5 and 6, below, display the population of adults and children in both MFLR and MFMR units.

Number of Adults Per Unit	Multi-Family Low-Rise					
	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	15	0	0
1	1	1	1	1	1	2
2	13	26	2	3	6	32
3	5	15	3	0	0	15
4 or more	0	0	4 or more	0	0	0
Total	19	42	Total	19	7	49

FIGURE 5: POPULATION MULTI-FAMILY LOW-RISE UNITS

Number of Adults Per Unit	Multi-Family Medium-Rise					
	ADULTS		Number of Children Per Unit	CHILDREN		Total Number of Persons
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	31	0	0
1	24	24	1	5	5	29
2	12	24	2	0	0	24
3	0	0	3	0	0	0
4 or more	0	0	4 or more	0	0	0
Total	36	48	Total	36	5	84

FIGURE 6: POPULATION MULTI-FAMILY MEDIUM-RISE UNITS

SECTION 6

SUMMARY OF THE SITE MANAGERS' PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of site management's understanding of the extent of solid waste collection/disposal facilities and services, of expected resident practices in storing and disposing solid wastes, of regulations governing resident storage and disposal actions and of use of facilities and services, of limitations, of services, and of charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and collection/disposal of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilities.

6.1.1 Single Family Units

Residents of single family units are expected to provide and maintain their own internal storage cans. When residents have filled their internal storage cans to capacity they are expected to move their wastes to an outdoor central collection dumpster.

Twice each week, a private contract hauler empties the dumpsters. Site management and the contract hauler clean, disinfect, and maintain the collection areas periodically.

Yard wastes such as grass clippings and leaves are collected by site management in their routine performance of yard maintenance service.

6.1.2 Multi-Family Units

Residents of MELR units are provided with trash chutes on each floor in which to deposit their wastes. The trash is conveyed through the chute to a ground floor trash room in which a compactor is located.

Three to four times each week, the compacted trash is removed by a private contract hauler.

6.2 Site Managers' Expectation of Resident Storage and Disposal Practices

Residents of single-family homes are expected to move and place all their trash into the outdoor central collection areas located throughout the site. Multi-family unit residents are expected to use the trash chutes located on each floor of their buildings. In addition, all residents are expected to use plastic trash bags to reduce odor and trash spillage. Site management does not require residents to separate trash. Yard wastes are collected and removed by the site management.

Site management provides removal service for large and small bulky wastes through the regular waste collection process.

6.3 Site Rules and Regulations

At the time of the survey, site management was unable to supply a copy of the written rules governing the operation of the solid waste disposal system. Essentially, the rules specify the location of the storage/disposal points for each housing type.

6.4 Limitations on Disposal Volume and Service Charges

There are no limitations on the amount of household trash which a single-family or multi-family resident can dispose of during any specific period. There is no specific provision or limitation on the amount or kind of bulky waste which can be disposed of through the system.

The cost of the trash collection services provided by the private contract hauler are borne directly by site management. The collection service is included in the basic monthly rental.

SECTION 7

RESIDENTS' SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains all the data describing the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- External solid waste storage practices (single family houses)
- Location of disposal site (Apartments)

7.1 Disposal of Bulky Wastes

The principal issues regarding bulky waste disposal and collection practices will be presented here. These issues include:

- Site management or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for large and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

There are site management trash disposal rules and regulations governing the disposal and collection of bulky waste at Crystal Lake. Basically the rules require residents to carry their trash to a chute or central container.

7.1.2 Placement of Large and Small Bulky Wastes

The small bulky waste type includes yard waste, small appliances and bulky cardboard items. The large bulky waste category includes such items as furniture and non-working major appliances.

Of the 128 respondents to trash separation questions, 48 percent (62) indicate that they separate small bulk items from their regular wastes while 100 percent of the respondents separate large bulky items from their regular household trash.

None of the SFD respondents separates small bulk items from their regular trash; however, 31 percent (22) of the SFA respondents do. Sixteen percent (3) of the MFLR respondents separate small bulk items from their regular trash while 100 percent of the MFHR respondents separate small bulk waste from regular household trash.

7.1.3 Responsibility for Bulky Waste Collection

Site management has provided for the removal of bulky waste items with the regular removal of wastes at this site.

Most of the respondents are aware of site management's role in the collection of bulky wastes. Figure 7, below, presents data on resident understanding of bulky waste removal responsibility.

	Small Items	Large Items
Local Government	6%	1%
Management	17	7
Taken to Dump	2	13
Private Collection Service	34	11
Don't Know	41	68
Total	100%	100%

FIGURE 7 : RESIDENT UNDERSTANDING OF BULKY WASTE DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

The types of bulk waste disposal are: bulk waste collection included in the regular trash pick-up, collection by "special" pick-up, and pick-up requested by the homeowner.

All of the SFD respondents indicate that small bulky items are collected with their regular trash; however, none of the SFD respondents know how large bulky items are collected. Seventy-six percent of the SFA respondents report that small bulky items are collected with their regular trash; eight percent think that removal of such items requires either a special pick-up or a request. Sixteen percent (11) of the SFA respondents do not know how to have small bulk items collected.

Seventy-four percent (14) of the MFLR respondents indicate that small bulk items are collected with their regular trash; five percent (1) think that residents must request pickup; and 21 percent (4) did not know how to have small bulk items collected. Forty-two percent (15) of the MFHR respondents say that small bulk items are collected with their regular trash, and eight percent (3) of them indicate that small bulky items are collected through a scheduled special pick-up. However, 50 percent of the MFHR respondents did not know how to have small bulk items collected.

7.2 Separation of Waste

There are no site rules which require residents to separate bulky wastes, glass, plastics, newspapers, food wastes, or other items before collection. Eighty-eight percent of the respondents do not separate some items out of their regular household trash.

Figure 8, which follows, presents the frequency, in number of cases and by percentage, of respondent waste separation.

Resident Action and Items	Percentage of Residents	Number of Cases
Separate Household Trash Items:		
Glass	1%	2
Bulky Wastes	8	10
Plastics	0.5	1
Food Wastes	2	3
Newspapers and Magazines	1	2
Frequency of Trash Separation	12	16
Frequency of Non-Separation	88	113
TOTAL	100%	129

FIGURE 8 : EXTENT OF RESIDENT TRASH SEPARATION

7.3 In-home Solid Waste Storage

The primary in-house solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined cans, trash compactor and other unspecified types.

Plastic trash bags are used by 42 percent (54) of the respondents while 52 percent (67) use grocery bags. Four percent (5) of the respondents use an unlined can as an in-house container and 2 percent (2) report the use of a trash compactor.

Residents report that they store the following items in their in-house containers: paper and packaging, glass bottles, plastic items, cardboard, newspapers, food wastes, and miscellaneous items such as bones and cans.

The following Figure 9 presents the number of respondents and percentage of respondents who reported the types of waste stored in their in-house containers and Figure 10 presents data on the frequency with which the in-house containers are filled.

Type of Waste	No. of Responses[1]	% of Responses
Paper/Packaging	127	98%
Glass Bottles	119	92
Plastic Items	123	95
Cardboard	116	90
Newspapers	100	78
Magazines	81	63
Food Wastes	69	53
Other: Bones, Husks, Rinds	2	1

[1] Out of a total of 129 Units surveyed

FIGURE 9 : TYPE OF WASTES STORED IN IN-HOUSE CONTAINERS

In-House Storage Fill-up Characteristics	HOUSING TYPE			
	SFD	SFA	MFLR	MFMR
Average times fill-ups per week	4.2	3.2	3.2	2.8
Number and percent reporting three or more fill-ups per week	4 of 4 (100%)	57 of 70 (81%	15 of 19 (79%)	24 of 36 (67%)
Number and percent reporting daily or more than daily fill-up	4 of 4 (100%)	36 of 70 (51%)	8 of 19 (42%)	9 of 36 (25%)

FIGURE 10 : FREQUENCY OF FILL-UP IN HOME STORAGE CAPACITY, BY HOUSING TYPE

7.3.2 Use of Trash Compactors

No in-house compactor was reported in use at this site.

7.4 External Solid Waste Disposal Practices

The practices for storage and disposal of solid wastes outside the home are essentially a function of the type of housing unit. For single family homes, solid wastes in excess of the in-home storage capacity is usually placed outside the interior living space until the exterior container is filled. Then the trash is moved to a central collection area. The apartment dwellers face the same needs. The excess storage facilities are typically congregate in nature and the external storage becomes a disposal function when the wastes are placed in a trash room, trash bin, or other storage facility.

7.4.1 External Storage - Single-Family Residents

There are four types of external storage containers: metal cans, plastic cans, plastic bags, and compactor bags. Respondents say that they use plastic cans and bags. They store trash in plastic bags and plastic cans outside their house, and later take it to the central storage location, or, in most cases, take it directly to the central storage area without storing it outside the house.

Some of the single-family residents state that they take their trash to the central collection area when their external house containers are full. Others place their wastes in plastic bags and take them directly to the central trash areas. The residents state that there are no limitations on the volume of household wastes collected.

7.4.2 Disposal Site - Apartment Residents

The apartment residents use the trash chutes located on each floor of the building or place trash in either the trash room or external bins.

MFLR respondents report moving their trash an average distance of 89 feet to a disposal site. MFHR respondents report moving their wastes an average distance of 48 feet to a disposal site.

SECTION 8

RESIDENTS' UNDERSTANDING OF THEIR RESPONSIBILITIES COSTS AND FREQUENCY OF SERVICES

This report section covers quantitative and qualitative data from interviewers with site management personnel and residents. The focus of the section is on establishing resident awareness of site management policy and arrangements regarding responsibility for providing solid waste collection services, payment for such services and their frequency of occurrence.

8.1 Responsibility for Solid Waste Collection

8.1.1 Household Trash

The management respondent at this site states that the collection of household trash for all types of dwelling units is a service performed by a private contract hauler. Resident awareness of the provider of collection services is low; 50 percent (65 out of 129) of the respondents think that site management is the direct provider of removal services. No respondent identifies the source of collection service as a private contract hauler. This misunderstanding is probably fostered by site management's role in yard maintenance and in the maintenance of the external storage facilities.

8.1.2 Bulky Wastes, Including Yard Wastes

The site management respondent reports that yard maintenance for all dwellings at this site is the responsibility of management personnel; this maintenance responsibility includes the removal of all yard wastes. The management respondent reports that regular collection service are flexible enough to void any necessity for prepaid collection services. This is supported by responses from the majority of residents indicating site management as the provider of removal services for small and large bulky items.

8.2 Resident Responsibilities for Payment of Service Charges

This section covers resident awareness of regular and special charges levied against them for trash collection and removal of yard wastes and bulky wastes. The text will compare aggregate resident awareness levels with management perceptions discussed under Section 7.

8.2.1 Resident Awareness of Type of Charges

None of the 129 respondents at this site reports awareness of any charges for the collection of small or large bulky items.

Most (97 out of 129) of the respondents are aware of the indirect nature of the service charges; 30 respondents are unaware of the nature of the service charges.

Overall, the respondents at this site are aware of the indirect nature of the service charges for waste removal; these charges do not generally prompt positive or negative attitudinal responses.

8.3 Frequency of Services - Resident vs. Management Perceptions

This section compares management and residents' perceptions of the frequency of regular trash collection services.

8.3.1 Single-Family Homes

Two SFD respondents (out of 3) report that trash is collected two times each week. Forty SFA respondents state that trash is collected twice weekly; 19 respondents state that they do not know the frequency of trash collection. The site management respondent states that trash is collected twice a week from the single family units.

None of the single family respondents state any limitation on the volume of household wastes collected.

Household trash is the only cause mentioned for the overloading.

8.3.2 Apartments

Trash is collected 3-4 times a week at the multi-family units. Seventy-six percent (42 of 55) respondents find the waste collection system adequate. Two (4 percent) of the respondents state that there are "too few containers" and there are 10 mentions of chute back-ups (18 percent).

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

The major environmental concerns to both management and the residents are odors, trash spillage causing littering effects, pets, and effects of weather causing flooding in trash storage areas, and littering. To assess the suitability of the system to the environment, residents were asked for their opinions on such unpleasant environmental effects which they encountered as a result of using the solid waste collection facilities and services. Their perceptions are presented below in terms of either apartment or single-family homes.

9.1 Environmental Impacts Perceived by Apartment Dwellers

Sixteen MFHR respondents report that their present form of waste disposal system provides adequate protection from environmental concerns. However, 53 percent (10 out of 19) of the MFLR respondents found the waste disposal system environmentally inadequate.

Odors are the most frequently mentioned (25 times) problem; followed by insects (14 mentions), weather (6 mentions) and susceptibility to household pets (4 mentions).

The most frequently mentioned (8 times) cause of the inadequacies is chute backups, followed by a shortage of containers (7 mentions).

9.2 Environmental Impacts Perceived by Single-Family Home Dwellers

Forty-nine percent of the single-family respondents find their waste disposal system environmentally adequate. Odors (14 mentions) and insects (12 mentions) are the major environmental inadequacies of the system. The reasons reported for these inadequacies are missing lids (3 mentions) and misfitting covers (4 mentions).

Eighty-one percent of the single-family respondents report that overloading is never a problem at this site; 15 percent report that it is hardly ever a problem.

9.3 Summary of Environmental Impacts Caused by Systemic Inadequacies

Generally, environmental concerns have impact on all residents at this site. The disposal system is inadequate to the needs of a majority of the respondents.

SECTION 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystems. The principal components investigated were:

- trash compactors
- external storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- regularity of service (e.g., trash collections)
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

10.1 Resident Attitudes Toward Suitability of Facilities and Equipment

10.1.1 Trash Compactor

Two trash compactors are in use at this site and neither household reports any compactor problems.

10.1.2 External Waste Storage Facility - Single Family Homes

None of the single family respondents reports frequent overloading of the external storage facility. Twenty-two percent (16) of the single family respondents find the waste storage containers inadequate.

The single family respondents cite a total of 38 problem mentions affecting the adequacy of waste storage containers at this site. Odors are the most frequently cited problem (14 mentions) followed by insects (12 mentions). The largest concentration of problems is in 2 adult households with 2 children.

Lacking or misfitting covers are the reasons reported for these problems.

10.1.3 External Waste Disposal Facilities - Apartments

Over 54 percent (30) of the multi-family respondents report their waste disposal system inadequate. REasons for the inadequacy of storage facilities: "too few containers, chute backups, and small and unclean trash rooms."

Eleven respondents report equipment problems: difficulty with the bin lid (2 respondents) chute door malfunction (5 respondents).

10.2 Attitudes About Movement of Wastes to Disposal/Collection Point

10.2.1 Single Family Home Dwellers

All of the single family respondents use the central collection facility and report no movement of external storage containers. Ten of the 74 respondents express seeing some danger from effects of weather, crossing roads, and physical disabling in the movement of trash to the collection bin.

10.2.2 Apartment Dwellers

MFLR respondents report moving their wastes an average of 89 feet to a disposal point. MFHR residents report moving their wastes an average 48 feet to a disposal point. None of the multi-family unit respondents sees any hazards in the movement of their wastes to a disposal point.

10.3 Complaints about Waste Collection Services

Residents of single-family homes were specifically queried about the adequacy of the waste collection service which was provided by the municipal government. Apartment dwellers normally have little and infrequent contact with waste collection as, in essence, their contact with the system stops after they have placed their trash in the chute. Thus, apartment dwellers were not asked for their opinions in this area.

Eleven of the 74 respondents report complaints about waste collection services.

The tenure of the resident in one indicator of the validity of a complaint. Respondents who have lived at the site for longer periods have had more time to observe problem situations. Figure 11 presents respondent complaints by tenure.

	Length of Residency			
Type of Complaint	6 months or less	7 months to one year	More than one year	Total Number of Complaints
Cans unemptied	0	1	1	2
Noisy trucks	0	0	5	5
Noisy equipment	0	1	6	7
Missed stops	0	1	1	2
Trash spilled	0	1	3	4
Uncollected items	0	0	1	1
TOTAL	0	4	17	21

FIGURE 11: TENURE OF COMPLAINANTS

10.4 Resident Attitudes About Problem Resolution

Residents were asked whom they would contact in the event that they encountered a trash collection problem. All but one of the respondents indicate that site management would be contacted for problem resolution.

Only 13 of the 129 respondents report having experienced a waste collection problem; only 1 of those problems was unresolved at the time of our survey.

10.5 Resident Attitudes Towards the Cost of Collection

None of the residents is aware of what charges are paid - either directly or indirectly through their rent - for trash collection. Only 2 residents responded to the questions about the quality of the trash collection services in terms of its cost. That response: the cost is "about right."

10.6 Resident Awareness of Service Providers and Innovations

Many (50 percent) respondents state that site management provides waste removal service. Waste removal service is actually provided by a private contract hauler. This misunderstanding is probably related to site management's role in the maintenance of waste disposal facilities. Also, 43 percent of the respondents don't know who provides this service.

Respondents are fairly unaware of innovative solid waste disposal techniques or equipment used at the site, despite their daily use of such equipment. Forty-nine percent of 129 respondents are aware of such devices at Edison Park. The awareness question was stated in a manner which did not aid awareness. If a respondent answered that he was not aware of innovations, then the innovations question was not asked. No prompting or extensive probing of respondents was attempted to ensure that their awareness was unaided.

In summary, the nature of this resident awareness of innovations is:

- Dumpsters - mentioned by 2 SFA, 28 SFD respondents
- Trash Chutes - mentioned by 11 MFHR respondents

7

MEMPHIS, TENNESSEE

SECTION 1

CONCLUSIONS

The analysis of the data collected from the site manager and residents of Edison Park resulted in conclusions on management and resident perceptions and attitudes on the following issues:

- Adequacy of trash storage and collection facilities and services.
- Trash and bulky waste storage requirements and practices of residents.
- Resident awareness of, and opinions about, solid waste disposal system operations, costs, and their responsibilities and point of interaction for resolving problems.
- Suitability of the system to the environment.

1.1 Conclusions About the Site Management's Attitudes and Impressions

The Site Management Interview was conducted on January 22, 1975. The site management representative expressed no overall opinion about the suitability of the system or the extent of resident problems. Site management gave no indication of either the cost or environmental suitability of the system. Management personnel are, however, involved with property maintenance, cleaning and disinfecting of the storage containers, and removal of yard maintenance wastes.

1.2 Conclusions About the Residents' Requirements, Attitudes, and Opinions

Edison Park has three housing types and varied waste disposal patterns and problems. Most of the respondents (73 percent) use grocery bags to store their in-house trash. A smaller group (41 percent) use plastic bags. The most common items stored in these in-house containers, in order of frequency, are paper and packaging, plastic items, cardboard, glass bottles, newspapers, magazines, and food wastes.

Half of the respondents separate large bulky items from their regular household trash and most (83 percent) of the respondents rely upon site management for the removal of these items.

Eighty-seven percent of the respondents from single family units report weekly overloading of the external storage containers. Thirty-eight percent of the respondents from multi-family low rise units reported waste storage container inadequacy.

Over 60 percent of the MFLR respondents report the disposal system as environmentally inadequate. Problems most frequently mentioned are weather scattering of trash, odors and insects.

There are no reports of inadequacy in the actual collection process itself and no respondent reports problems with the provider of the collection service.

SECTION 2
RECOMMENDATION

Based on the conclusions, a recommendation is warranted to

- Resolve waste container problems reported by respondents in single-family and multi-family low rise units.

Complaints about the adequacy of the external storage facilities relate directly to the shortage of external storage containers reported at this site. Virtually all of the respondents from the single-family units experience overloading of these external containers and over 60 percent of the respondents from multi-family low rise units cite a shortage of containers as the cause of a variety of environmental complaints.

Site management can resolve these complaints by either the addition of extra containers or by increasing the frequency of trash collection.

SECTION 3

PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

3.1 Size and Location of Site

The Memphis Operation Breakthrough Site consists of 15.9 areas. The site is located within walking distance of the Central Business District of Memphis, Tennessee.

3.2 Land Characteristics

The site is located in the Court Avenue Urban Renewal area of downtwon Memphis; it is bounded on three sides by major traffic arterials.

3.3 Description of Site

The site contains 518 units in a mixture of building types: high rise for the elderly moderate income garden apartments and townhouse units and student housing in garden and high rise apartments. Overall density of the site is approximately 32 units per acre. These building types are designed as an integral community within the constriants of an urban site.

Most of the parking area, there are 1.5 parking spaces per unit, is covered by a deck which is open space for recreation purposes. This pedestrian deck is integrally connected to all building elements and bridges the major arterials which bound the site. The Thomas Edison Memorial Park, situated in the western portion of the park, provides the major noise pollution barrier to the traffic noise generated by the major traffic arterials. The site is a demonstration of how an urban site subjected to noise pollution from surrounding highways, can be properly designed for residential use by the creation of sound barriers.

SECTION 4

CHARACTERISTICS OF SITE HOUSING

In this section a discussion of the characteristics of the site's housing stock is presented. The focus is on amount and type of housing, rather than on the physical and/or architectural housing characteristics. The extent and length of occupancy and housing costs are also discussed here.

4.1 Types and Numbers of Housing Units

There are three different types of housing units present at the site. These are single-family attached (SFA), multi-family low rise (MFLR) which are four stories or less, and multi-family high rise (MFHR) which are 5 or more stories.

The largest group are the MFHR with 350 units. These are either efficiency or 1 or 2 bedroom homes. Next in size are the MFLR units which number 99. These are either 1, 2, or 3 bedroom homes.

There are 69 SFA units which are either 1 or 2 bedroom types.

In total there are 518 units. Of these, 168 are included in our sample for the resident survey. All data which are presented hereafter was derived from our sample which is stratified by housing type as follows:

- Single family attached - 22 units
- Multi-family low rise - 62 units
- Multi-family high rise - 114 units

4.2 Ownership and Occupancy

The site manager was interviewed on January 20, 1975 and reports that SFA, MFLR, and MFHR are occupied at a level of 98 percent occupancy. The site manager feels that 100 percent occupancy represents "full occupancy" for all units does not know when this level will be reached.

The site's occupied units are rented. The rental range for each type of housing is shown below in Figure 7.

Housing Type	Number of Bedrooms	Monthly Rental Range
SFA	2 or 3	$134.99 to $232.25
MFLR	1 to 3	$ 0 to $ 40.00
MFHR(elderly)	Efficiency to 2	$123.74 to $232.25
MFHR	Efficiency to 2	$139.50 to $159.50

FIGURE 1: RENTAL RANGES BY HOUSING TYPE

The length of occupancy (tenure) is an important characteristic to note, as it provides a baseline of resident experience against which to measure attitudes and perceptions about the site and its solid waste disposal system. Tenure ranges from less than 3 months to more than 18 months across the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	Dwelling Type						No. and % by Tenure	
	SFA		MFLR		MFHR			
	No.	%	No.	%	No.	%	Total	%
Less than 3	3	14	1	3	14	12	18	11
4 to 6	2	9	6	19	16	14	24	15
7 to 9	1	5	2	6	14	12	17	10
10 to 12	2	9	7	22	8	7	17	10
13 to 18	5	23	8	25	48	42	61	36
More than 18	9	40	8	25	14	13	31	18
Total	22	100%	32	100%	114	100%	168	100%
Average Tenure	15.0 months		14.2 months		12.1 months			
Median Tenure	14.1 months		12.5 months		14.2 months			

FIGURE 2: TENURE OF RESIDENTS BY DWELLING TYPE

SECTION 5

RESIDENT CHARACTERISTICS

This section presents the characteristics of Edison Park residents in terms of retirement status, number of adults, and number of children. Other types of demographic data were not collected for this survey.

5.1 Retirement Status of Household Heads

All of the sixty-three retired respondents live in the multi-family high rise units at this site.

5.2 Number of Adults and Children

For the 168 units surveyed, population data was collected on adults and children which specifically categorized the number of residents per unit as follows:

- Adults
    - .. 1
    - .. 2
    - .. 3
    - .. 4 or more
- Children
    - .. 0
    - .. 1
    - .. 2
    - .. 3
    - .. 4 or more

Use of this type of categorization usually limits the precision of population data to minimum numbers of adults and children. However, exact population responses were obtained for all 168 units as no respondent indicates 4 or more adults or children reside in his unit. Three hundred and twelve persons live in the sample units of whom 272 are adults and 40 are children.

5.2.1 Adults and Children in Single Family Attached Houses

Forty-four adults and 28 children, a total of 72 persons, reside in the 22 single family attached homes sampled. Five respondents report no children reside in their residences.

Number of Persons Per Unit	ADULTS		CHILDREN		Total Number of Persons
	Number of Units	Number of Persons	Number of Units	Number of Persons	
0	--	--	5	0	
1	0	0	8	8	8
2	22	44	7	14	58
3	0	0	2	6	6
4 or more	0	0	0	0	0
Total	22	44	22	28	72

FIGURE 3: POPULATION OF SFA UNITS

5.2.2 Adults and Children in Multi-Family Units

Two-hundred and forty persons live in the sampled multi-family units, with 71 residing in the 32 low rise units and 169 residing in the 114 high rise units. Of these 228 are adults and 12 are children.

Figures 4 and 5 below, displays the population of adults and children in MFLR and MFHR units, and the number of adults and children per unit.

Number of Adults Per Unit	Multi-Family Low Rise					Total Number of Persons
	ADULTS		Number of Children Per Unit	CHILDREN		
	Number of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	24	0	0
1	5	5	1	5	5	10
2	26	52	2	3	6	58
3	1	3	3	0	0	3
4 or more	0	0	4 or more	0	0	0
Total	32	60	Total	32	11	71

FIGURE 4: POPULATION OF MULTI-FAMILY LOW-RISE UNITS

Number of Adults Per Unit	Multi-Family High Rise					Total Number of Persons
	ADULT		Number of Children Per Unit	CHILDREN		
	Number Of Units	Number of Adults		Number of Units	Number of Children	
0	--	--	0	113	0	0
1	63	63	1	1	1	64
2	48	96	2	0	0	96
3	3	9	3	0	0	9
4 or more	0	0	4 or more	0	0	0
Total	114	168	Total	114	1	169

FIGURE 5: POPULATION OF MULTI-FAMILY HIGH-RISE UNITS

SECTION 6

SUMMARY OF THE SITE MANAGER'S PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of the site manager's understanding of the extent of solid waste disposal/collection facilities and services, their expectation of resident practices in storing and disposing solid wastes, regulations governing resident storage and disposal actions and use of facilities and services and limitations and charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and compaction of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilities. The discussion which follows presents the application of such facilities and services for each type of housing.

6.1.1 Single-Family Homes

Residents of single family units are expected to provide and maintain their own internal storage cans. When residents have filled their internal storage cans to capacity they are expected to move their wastes to an outdoor central collection dumpster.

Twice each week, a private contract hauler empties the dumpsters. Site management and the contract hauler clean, disinfect, and maintain the collection areas periodically.

Yard wastes such as grass clippings and leaves are collected by site management in their routine performance of yard maintenance service.

6.1.2 Multi-Family Units

Residents of MFLR units are provided with trash chutes on each floor in which to deposit their wastes. The trash is conveyed through the chute to a ground floor trash room.

Three to four times each week, the trash is removed by a private contract hauler.

6.2 Site Managers' Expectation of Resident Storage and Disposal Practices

Residents of single-family homes are expected to move and place all their trash into the outdoor central collection areas located throughout the site. Multi-family unit residents are expected to use the trash chutes located on each floor of their buildings. Site management does not require residents to separate trash. Yard wastes are collected and removed by the site management.

Site management has provided for the removal of large and small bulky wastes through the regular waste collection process.

6.3 Site Rules and Regulations

At the time of the survey, site management was unable to supply a copy of the written rules governing the operation of the solid waste disposal system. Essentially the rules specify the location of the storage/disposal points for each housing type.

6.4 Limitations on Disposal Volume and Service Charges

There are no limitations on the amount of household trash which a single-family or multi-family resident can dispose of during any specific period. There is no specific provision or limitation on the amount or kind of bulky waste which can be disposed of through the system.

The cost of the trash collection services provided by the private contract hauler are borne directly by site management. The collection service is included in the basic monthly rental.

SECTION 7

RESIDENTS' SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains data describing the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- External solid waste storage practices (single family houses)
- Location of disposal site (Apartments)

7.1 Disposal of Bulky Wastes

The principal issues regarding bulky waste disposal and collection practices will be presented here. These issues include:

- Site management or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for large and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

There are no site management or trash disposal service rules or regulations governing the disposal and collection of bulky waste at Edison Park.

7.1.2 Placement of Large and Small Bulky Wastes

The small bulky waste type includes yard waste, small appliances and bulky cardboard items. The large bulky waste category includes such items as furniture and non-working major applicances.

Of the 168 respondents interviewed at this site, 30 percent (50) indicate that they separate small bulk items from their regular wastes while 50 percent (84) of the respondents separate large bulky items from their regular household trash.

None of the SFA respondents separates small bulk items from their regular trash. Thirteen percent (4) of the MFLR respondents separate small bulky items from their regular trash while 69 percent of the MFHR respondents separate small bulk waste from regular household trash.

7.1.3 Responsibility for Bulky Waste Collection

Site management has provided for the removal of bulky waste items with the regular removal of wastes at this site.

Most of the respondents are aware of site management's role in the collection of bulky wastes. Figure 6, below, presents data on resident understanding of bulky waste removal responsibility.

	Small Items	Large Items
Local Government	2%	2%
Management	96	83
Taken to Dump	0	0
Private Collection Service	0	0
Don't Know	2	15
Total	100	100

FIGURE 6 : RESIDENT UNDERSTANDING OF BULKY WASTE DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

The types of bulk waste disposal are: bulk waste collection included in the regular trash pick-up, collection by "special" pick-up, and pick-up requested by the homeowner.

All of the SFA respondents indicate that small bulky items are collected with their regular trash. All but one of the SFA respondents indicate that large bulky items are collected with their regular trash.

Seventy-two percent of the multi-family unit respondents report that large bulk items are collected with their regular trash. Seven percent of the respondents think that removal of large bulk items requires either a special pick-up or a respondent request for collection. Twenty-one percent of the multi-family unit respondents do not know how to have large bulk items removed. Only one SFA respondent does not know how to have large bulky items collected.

7.2 Separation of Waste

There are no site rules which require residents to separate bulky wastes, glass plastics, newspapers, food wastes, or other items before collection. Thirty percent of the respondents separate small bulky trash from regular household trash; 50 percent of the respondents separate large bulky items from their regular trash.

Figure 7, which follows, presents the frequency, in number of cases and by percentage, of respondent waste separation.

Resident Action and Items	Percentage of Residents	No. of Cases
Separate Household Trash Items:		
Glass	10	17
Bulky Wastes	3	6
Plastics	4	7
Food Wastes	23	38
Newspapers and Magazines	14	24
Other--cans	1	2
Frequency of Trash Separation	37	63
Frequency of Non-Separation	63	105
TOTAL	100%	168

FIGURE 7 : EXTENT OF RESIDENT TRASH SEPARATION

7.3 In-home Solid Waste Storage

The primary in-house solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined cans, trash compactor and other unspecified types.

Plastic trash bags are used by 24 percent (41) of the respondents while 73 percent (123) use grocery bags. Less than 3 percent (4) of the respondents use an unlined can as an in-house container. No respondent reportes the use of a trash compactor.

Residents report that they store the following items in their in-house containers: paper and packaging, glass bottles, plastic items, cardboard, newspapers, food wastes, and miscellaneous items such as bones and cans.

The following figure presents the number of respondents and percentage of respondents who report the types of waste stored in their in-house containers.

Type of Waste	Number of Responses[1/]	% of Responses
Paper/Packaging	164	98%
Glass Bottles	150	89
Plastic Items	160	95
Cardboard	155	92
Newspapers	132	79
Magazines	128	76
Food Wastes	116	69
Other: Cans	19	11
Bones	3	2

[1/] Out of a total of 168 units surveyed

FIGURE 8: TYPE OF WASTES STORED IN IN-HOUSE CONTAINERS

In-House Storage Fill-up Characteristics	HOUSING TYPE		
	SFA	MFLR	MFMR
Average times fill-ups per week	3.8	3.2	2.8
Number and percent reporting three or more fill-ups per week	22 of 22 (100%)	27 of 32 (84%)	69 of 114 (61%)
Number and percent reporting daily or more than daily fill-up	7 of 22 (32%)	11 of 32 (34%)	35 of 114 (31%)

FIGURE 9: FREQUENCY OF FILL-UP IN HOME STORAGE CAPACITY, BY HOUSING TYPE

7.3.2 Use of Trash Compactors

No in-house compactor is reported in use at this site.

7.4 External Solid Waste Disposal Practices

The practices for storage and disposal of solid wastes outside the home are essentially a function of the type of housing unit. For single family homes, solid wastes in excess of the in-home storage capacity is usually placed outside the interior living space until the exterior container is filled. Then the trash is moved to a central collection area. The excess storage facilities for apartment dwellers are typically congregate in nature, and external storage is a disposal function. The major issues involved in external storage are viewed differently for single-family home dwellers and apartment dwellers.

7.4.1 External Storage - Single-Family Residents

There are four types of external storage containers: metal cans, plastic cans, plastic bags, and compactor bags. Respondents use plastic cans and bags. They store trash in plastic bags and plastic cans outside their house, and later take it to the central storage location, or, in most cases, take it directly to the central storage area without storing it outside the house.

Site rules require that trash is taken to the central collection area when their external house containers are full. Others place their wastes in plastic bags and take them directly to the central tash areas. The residents state that there are no limitations on the volume of household wastes collected.

7.4.2 Disposal Site-Apartment Residents

The apartment residents use the trash chutes located on each floor of the building (64 percent), or place trash in either the trash room (6 percent) or external bins (30 percent of the respondents).

MFLR respondents report moving their trash an average distance of 102 feet to a disposal site. MFHR respondents report moving their wastes an average distance of 36.5 feet to a disposal site.

SECTION 8

RESIDENTS' UNDERSTANDING OF THEIR RESPONSIBILITIES COSTS AND FREQUENCY OF SERVICES

This report section contains quantitative and qualitative data from interviews with site management personnel and residents. The focus of the section is on establishing resident awareness of site management policy and arrangements regarding responsibility for providing solid waste collection services, payment for such services and their frequency of occurrence.

8.1 Responsibility for Solid Waste Collection

8.1.1 Household Trash

The management respondent at this site states that the collection of household trash for all types of dwelling units is a service performed by a private contract hauler. Resident awareness of the provider of collection services is low: 98 percent (164 out of 168) of the respondents think that site management is the direct provider of removal services. No respondent identifies the source of collection services as a private contract hauler. This misunderstanding is probably fostered by site management's role in yard maintenance and in the maintenance of the external storage facilities.

8.1.2 Bulky Wastes, Including Yard Wastes

The site management respondent reports that yard maintenance for all dwellings at this site is the responsibility of management personnel; this maintenance responsibility includes the removal of all yard wastes. The management respondent reports that regular collection services are flexible enough to void any necessity for special collection services. This is supported by responses from the majority of residents indicating site management as the provider of removal services for small and large bulky items.

8.2 Resident Responsibilities for Payment of Service Charges

This section covers resident awareness of regular and special charges levied against them for trash collection and removal of yard wastes and bulky wastes. The text will compare aggregate resident awareness levels with management perceptions discussed under Section 7.

8.2.1 Resident Awareness of Type of Charges

None of the 168 respondents at this site reports awareness of any charges for the collection of small or large bulky items.

Ninety-nine percent (166 out of 168) of the respondents are aware of the indirect nature of the service charges; two respondents are unaware of the nature of the service charges. Only one resident expresses an attitude ("uncertainty") about the cost of the collection service.

Overall, the respondents at this site are aware of the indirect nature ofthe service charges for waste removal; these charges do not generally prompt positive or negative attitudinal responses.

8.3 Frequency of Services - Resident vs. Management Perceptions

This section compares management and residents perceptions of the frequency of regular trash collection services.

8.3.1 Single-Family Homes

One of the 22 SFA respondents reports that trash is collected from 3-4 times each week. Fifteen SFA respondents state that trash is collected more than 5 times weekly; 6 respondents state that they do not know the frequency of trash collection. The site management respondent states that trash is collected twice a week from the single family units.

None of the SFA respondents states any limitations on the volume of household wastes collected.

All of the SFA respondents experience overloading of the external storage facilities. Nineteen of the 22 respondents experience weekly overloading. One respondent reports monthly overloading and 2 respondents observe that the external storage containers are "hardly ever" overloaded. Household trash is the only cause mentioned for the overloading.

8.3.2 Apartments

Trash is collected 3-4 times a week at the multi-family units. Eightly-nine percent (130 of 146) respondents find the waste collection system adequate. Fourteen (10 percent) of the respondents state that there are "too few containers" and there is one mention of a chute back-up.

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

The major environmental concerns to both management and the residents are odors, trash spillage causing littering effects, pets, and effects of weather causing flooding in trash storage areas, and littering. To assess the suitability of the system to the environment, residents were asked for their opinions on unpleasant environmental effects encountered as a result of using the solid waste collection facilities and services. Their perceptions are presented below.

9.1 Environmental Impacts Perceived by Apartment Dwellers

All 114 MFHR respondents report that their present form of waste disposal system provides adequate protection from environmental concerns. However, 63 percent (20 out of 32) of the MFLR respondents find the waste disposal system environmentally inadequate.

Inadequate protection from the effects of weather is the most frequently mentioned (14 times) problem; followed by odors (11 mentions), insects (5 mentions), and susceptibility to household pets (3 mentions). The complaints come primarily from 2 adult, childless homes.

The most frequently mentioned (17 times) cause of these inadequacies is a shortage of containers followed by misfitting covers (3 mentions), and missing lids (1 mention). The complaints are unrelated to tenure.

9.2 Environmental Impacts Perceived by Single-Family Home Dwellers

Seventy seven percent of the SFA respondents find their waste disposal system environmentally adequate. Odors (5 mentions) and weather effects (2 mentions) are the only reported inadequacies of the system. The only reason cited for these inadequacies is a shortage of cans (5 mentions). Complaints are primarily from 2 adult homes with 2 children. The complainants use 3 or more storage cans each week.

Nineteen of the 22 respondents (86 percent) report weekly overloading. This overloading tends to increase with tenure; over half of the respondents reporting weekly overloading have lived at this site longer than 1 year. THe problem of weekly overloading is greatest among 2 adult households with 0, 1 or 2 children. Eighteen of the 19 respondents reporting weekly overloading use 4 or more external storage cans weekly. No complaints about the waste collection service are reported.

9.3 Summary of Environmental Impacts Caused by Systemic Inadequacies

Generally, environmental concerns have their greatest impact on MFLR residents and, to a lesser extent, on SFA residents. The disposal system is adequate to the needs of the MFHR respondents.

SECTION 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystems. The principal components investigated were:

- trash compactors
- external storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- regularity of service (e.g., trash collections)
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

10.1 Resident Attitudes Toward Suitability of Facilities and Equipment

10.1.1 Trash Compactor

No trash compactor is in use at this site.

10.1.2 External Waste Storage Facility - Single Family Homes

Eighty seven percent (19) of the 22 SFA respondents report weekly overloading of the external storage facility. None of the respondents reports that overloading is never a problem.

Twenty-three percent (5) of the 22 SFA respondents find the waste storage containers inadequate. The problem increases with time as 4 out of the 5 complainants have lived at this site longer than a year.

The 5 SFA respondents cite a total of 7 problem mentions affecting the adequacy of waste storage containers at this site. Odors are the most frequently cited problem (5 mentions) followed by weather effects (2 mentions). The largest concentration of problems is in 2 adult households with 2 children.

Problems are encountered most frequently by households which fill an in-house container daily (4 of 7 problem mentions) and households using 3 or more storage containers weekly (7 out of 7 mentions). A shortage of cans (5 mentions) is the only reported reason for the system's inadequacy.

10.1.3 External Waste Disposal Facilities - Apartments

Over 96 percent (110) of the 114 MFHR respondents report their waste disposal system adequate. However, 38 percent (12 of 32) of the MFLR respondents find reasons for inadequacy of their waste storage facilities; the reason, reported by all 12 respondents is "too few containers.: The complaints are unrelated to tenure but are concentrated in 2 adult, childless households.

Only 3 respondents report equipment problems: difficulty with the bin lid (2 respondents) and chute door malfunctions (1 respondent). All of the problems are reported by MFLR residents.

10.2 Attitudes About Movement of Wastes to Disposal/Collection Point

10.2.1 Single-Family Home Dwellers

All of the SFA respondents use the central collection facility and report no movement of external storage containers. Four of the 22 respondents express fears of some danger from effects of weather in the movements of trash to the collection bin. All of these respondents live in 2 adult homes, and use 4 storage cans weekly.

10.2.2 Apartment Dwellers

MFLR respondents report moving their wastes an average of 37 feet to a disposal point. None of the multi-family unit respondents sees any hazards in the movement of wastes to a disposal point.

10.3 Complaints About Waste Collection Services

Residents of single-family homes, were specifically queried about the adequacy of the waste collection service which was provided by the municipal government. Apartment dwellers normally have little and infrequent contact with waste collection as usually their contact with the system ends after they have placed their trash in the chute; apartment dwellers were not asked for their opinions in this area.

None of the SFA respondents report any complaints about waste collection services.

10.4 Resident Attitudes About Problem Resolution

Residents were asked whom they would contact in the event that they encountered a trash collection problem. All but one of the respondents (who "does not know") indicate that site management would be contacted for problem resolution.

Only 12 of the 168 respondents report having experienced a waste collection problem; however 10 of those problems were unresolved at the time of our survey.

10.5 Resident Attitudes Towards the Cost of Collection

One of the residents is aware of what charges are paid - either directly or indirectly through their rent - for trash collection. Only one resident attempted a response to the questions about the quality of the trash collection services in terms of its cost. That response is an "unsure."

10.6 Resident Awareness of Service Providers and Innovations

All but 3 residents (who "did not know") state that site management provides waste removal service. Waste removal service is actually provided by a private contract hauler. This misunderstanding is probably related to site management's role in the maintenance of waste disposal facilities.

Residents are relatively unaware of innovative solid waste disposal techniques or equipment used at the site: trash chutes and central bins. Only 20 percent of 168 residents are aware of such devices at Edison Park. The awareness question was asked in a manner which did not bias their response. No prompting or extensive probing of respondents was attempted; their recall of innovations was unaided.

In summary, the nature of this resident awareness of innovation is:

- Dumpsters - mentioned by 13 SFA, 12 MFLR, and 11 MFHR respondents;
- Compactors - mentioned by 2 MFLR and 5 MFHR respondents; and
- Trash Chutes - mentioned by 5 MFHR respondents.

8

SACRAMENTO, CALIFORNIA

SECTION 1
CONCLUSIONS

Based on analysis of the data collected from the site management representative and residents of Greenfair, conclusions on management and resident perceptions and attitudes on the following issues were reached:

- Adequacy of trash storage and collection facilities and services.
- Trash and bulky waste storage requirements and practices of residents.
- Resident awareness of, and opinions about, the solid waste disposal system operations costs, and their responsibilities and point of interaction for resolving problems.
- Suitability of the system to the environment.

1.1 Conclusions About the Site Manager's Attitudes and Impressions

The Site Management Interview was conducted on January 22, 1975. The site management representative expresses no overall opinion about the extent of resident problems or the degree of resident cooperation. Site management is active in some areas, e.g., yard maintenance, which affect the waste disposal system but has no involvement in the operation of that system.

1.2 Conclusions About the Residents' Requirements, Attitudes and Opinions

The Greenfair respondents are from three distinct housing types and have varied waste disposal patterns and problems. Most (70 percent) of the respondents use grocery bags to store their in-house trash. A smaller group (15 percent) uses plastic bags for this purpose. The residents (1 percent) use in-house trash compactors. The most common items stored in these in-house containers, in order of frequency, are paper and packaging, plastic items, glass bottles, cardboard items, food wastes, newspapers, and magazines.

Ninety-seven percent of the respondents separate large bulky items from regular wastes. These respondents arrange for the removal of these bulky waste items from a variety of sources. Only 2 percent of the respondents regularly separate other items from their trash.

Forty percent of the respondents feel that disposal services and facilities are inadequate. Among the reasons respondents cite as causes of these inadequacies are a shortage of containers and missing or misfitting covers. The limited environmental results of these container inadequacies are odor, weather and pet scattering of trash, and insect and vermin problems.

Major deficiencies appear in the provision of waste collection services at this site. Respondents note with high frequency a number of problems with the service provider, These problems include spilled trash, uncollected items, and damaged cans.

SECTION 2
RECOMMENDATIONS

Based on the conclusions, recommendations are warranted to

- Focus and alleviate resident concerns about deficiencies in the provision of waste collection services.

Involvement of Site Management in Improvement of Waste Collection Services

Presently site management personnel have no active role in the solution of problems residents encounter with the municipal agency which collects the residents' waste. Given the moderate number (60 percent) of respondents who would contact this agency to seek a solution to a waste disposal problem, the intercession of site management would be appropriate.

Although few respondents (less than 17 percent) state that they have actually encountered collection problems. Substantial numbers report spilled trash, uncollected items and damaged cans.

Site management personnel, through maintenance of a resident complaint file and direct contact with the municipal collection agency, can focus resident concerns about service deficiencies and monitor the agency's attempts to correct them.

SECTION 3

PHYSICAL AND ENVIRONMENTAL DESCRIPTION OF SITE

3.1 Size and Location of Site

The Sacramento Operation Breakthrough Site consists of 30.38 acres. The site is located four miles southwest of downtown Sacramento.

3.2 Land Characteristics

The site is primarily clear and flat with the exception of a small grove of trees retained in the site plan. Formerly the site was the eastern portion of the Old State Fairgrounds.

3.3 Description of Site Layout

The site contains 407 units of varied density building types which are one single-family attached and single-family detached residences and multi-family high-rise and low-rise structures. Overall density of the site is 13.3 units per acre. The cluster planning approach was used to maximize common space and to reduce site utility costs. The clusters were kept small to reinforce a strong sense of community identity for residents while limiting the number of families to a level where social interaction is meaningful.

The traffic circulation system was developed to minimize undesirable impact on the surrounding community. A major loop road distributes traffic to the interior of the site. Streets have been landscaped to maintain the tree-lined characteristics of the surrounding community. Parking was planned at a variable ratio of from one to car spaces per four multi-family high-rise units (which provide housing for the elderly) to two spaces per single family detached unit.

A variety of open space is provided within the site; these include a space for each unit which is related to a larger common court, an open park area, tot lots and conversation areas. A community center and swimming pool are adjacent to the large open park area.

SECTION 4

CHARACTERISTICS OF SITE HOUSING

In this section a discussion of the characteristics of the site housing is presented. The focus is on amount and type of housing, rather than on the physical and/or architectural housing characteristics. The extent and length of occupancy and housing costs are also discussed here.

4.1 Types and Numbers of Housing Units

There are four different types of housing units present at the site. These are single-family attached (SFA), single-family detached (SFD), multi-family low rise (MFLR) which are four stories or less, and multi-family high rise (MFHR) which are 5 or more stories.

The largest group are the SFA with 119 units. These are either 2, 3 or 4 bedroom homes. Next in size are the MFHR units which number 112. These are 1 bedroom units.

There are 80 MFLR units which are either 1, 2 or 3 bedroom types, as well as 10 SFD units which are either 3 or 4 bedroom types.

In total there are 192 units. Of these, 152 are included in our sample for the resident survey. All data derived from our sample which is stratified by housing type as follows:

• Single family detached -	11 units
• Single family attached -	98 units
• Multi-family low rise -	43 units

4.2 Ownership and Occupancy

The site manager was interviewed on January 22, 1975. The site manager reported that SFA and SFD were 90 percent occupied. MFLR units were fully occupied at a level of 100 percent. The site manager was uncertain when full occupancy for the SFA and SFD units would be reached.

Housing Type	Number of Bedrooms	Monthly Rental Range
SFA	2 to 4	$230 to $285
SFD	3 to 4	$250 to $290
MFLR	1 to 3	$93.50 to $120.56

FIGURE 1: RENTAL RANGES BY HOUSING TYPE

The length of occupancy (tenure) is an important characteristic to note, as it provides a baseline of resident experience against which to measure attitudes and perceptions about the site and its solid waste disposal system. Tenure ranged from less than 3 months to more than 18 months across the sample of residents. Figure 2 presents data on tenure by type of dwelling and significant statistics on average and median length of tenure.

TENURE (In months)	Dwelling Type								No. and % by tenure	
	SFD		SFA		MFLR		MFHR			
	No.	%	No.	%	No.	%	No.	%	Total	%
Less than 3	1	9	10	10	3	7	--	--	14	9
4 to 6	1	9	15	15	1	2	--	--	17	11
7 to 9	2	18	18	18	2	5	--	--	22	14
10 to 12	0	0	6	6	3	7	--	--	9	6
13 to 18	1	9	5	5	3	7	--	--	9	6
More than 18	6	55	44	46	31	72	--	--	81	54
Total	11	100%	98	100%	43	100%	--	100%	152	100%
Average Tenure	16.5 months		14.2 months		21.1 months		-- months			
Median Tenure	22 months		12.5 months		23.8 months		-- months			

FIGURE 2: TENURE OF RESIDENTS BY DWELLING TYPE

SECTION 5
RESIDENT CHARACTERISTICS

This section presents the characteristics of Greenfair residents in terms of retirement status, number of adults and number of children. Other types of demographic data were not collected for this survey.

5.1 Retirement Status of Household Heads

Fifty-three of the 152 sampled heads of households are retired. Forty three of these retirees lived in MFLR units, 9 in SFA units, and 1 resided in an SFD residence.

5.2 Number of Adults and Children

For the 152 units surveyed, population data was collected on adults and children which categorized the number of residents per unit in this manner:

- Adults
  - .. 1
  - .. 2
  - .. 3
  - .. 4 or more
- Children
  - .. 0
  - .. 1
  - .. 2
  - .. 3
  - .. 4 or more

Use of this type of categorization usually limits the precision of population data to minimum numbers of adults and children. At least 409 persons live in the sampled units. Of that number at least 297 are adult and 112 are children. None of the MFLR units contained any children.

5.2.1 Adults and Children in Single Family Detached Homes

At least 23 adults and 8 children, a total of at least 31 persons reside in the 11 single family detached units included in our sample. One unit reported 4 or more adults in residence and 1 unit reported 4 or more children. There are 6 units which reported no children. Figure 3 below presents data on the adult and child populations of the SFD units.

Number of Persons Per Unit	ADULTS		CHILDREN		Total Number of persons
	Number of Units	Number of persons	Number of Units	Number of persons	
0	--	--	6	0	
1	1	1	2	2	3
2	6	12	1	2	14
3	3	9	1	3	12
4 or more	1	≧1	1	≧1	≧2
Total	11	≧23	11	≧8	≧31

FIGURE 3: POPULATION OF SFD UNITS

5.2.2 Adults and Children in Single Family Attached Homes

At least 313 persons reside in the 98 single family attached units sampled. Of these at least 209 are adults and at least 104 are children. None units report 4 or more adults in residence and 1 unit houses 4 or more children. Figure 4 presents data on the adult and child populations of the sampled SFA units.

Number of Persons Per Unit	ADULTS		CHILDREN		Total Number of persons
	Number of Units	Number of persons	Number of Units	Number of persons	
0	--	--	34	0	0
1	15	15	27	27	42
2	64	128	17	34	162
3	10	30	13	39	69
4 or more	9	≥36	1	≥4	≥40
Total	98	≥ 209	98	≥104	≥313

FIGURE 4: POPULATION OF SFA UNITS

5.3.3 Adults and Children in Multi Family Units

Exact population responses are available for the 43 MFLR units sampled as no unit reports 4 or more adults or children in residence. Sixty-five persons, all of whom are adult, live in the 43 MFLR units. The following figure displays the population data collected from these residents.

Number of Persons Per Unit	Multi-Family Low Rise				
	ADULTS		CHILDREN		Total Number of Persons
	Number Of Units	Number of Persons	Number Of Units	Number Of Persons	
0	--	--	43	0	0
1	21	21	0	0	21
2	22	44	0	0	44
3	0	0	0	0	0
4 or more	0	0	0	0	0
TOTAL	43	65	43	0	65

FIGURE 5: POPULATION OF MULTI-FAMILY HOUSING

SECTION 6

SUMMARY OF THE SITE MANAGER'S PERCEPTIONS REGARDING THE OPERATION AND MAINTENANCE OF THE SITE'S SOLID WASTE DISPOSAL SYSTEM

This section contains a summary statement of the site manager's understanding of the extent of solid waste disposal/collection facilities and services, their expectation of resident practices in storing and disposing solid wastes, regulations governing resident storage and disposal actions and use of facilities and services and limitations and charges for services. These issues are also discussed in later sections of the report in the context of resident perceptions and attitudes.

6.1 Extent of Facilities and Services for Solid Waste Collection

As applied here the term "facilities" refers to mechanical equipment and interior and exterior space used for storage and compaction of solid wastes. The term "services" refers to collection and removal of solid wastes as well as maintenance of the solid waste disposal facilities. The discussion which follows presents the application of such facilities and services for each type of housing.

6.1.1 Single-Family Homes

SFD and SFA residents are expected to provide and maintain their own internal and external storage cans. When residents fill their storage cans to capacity they are expected to move their wastes to the curbside at the front of their residences for collection.

Once each week, the municipal government-operated trash collection service empties those cans. The residents clean, disinfect, and maintain their own containers.

6.1.2 Multi-Family Low-Rise Units

MFLR units are provided with trash collection facilities at the rear or side of each structure. One large can is provided for each three living units and collection is provided daily by the municipal government.

6.2 Site Manager's Expectation of Resident Storage and Disposal Practices

Residents of single-family homes are expected to place their filled trash containers at curbside for collection. MFLR residents are expected to deposit their wastes in the external containers provided for their units. Site management does not require residents to separate trash.

The removal of small and large bulky wastes is the responsibility of each resident and may be arranged by special request to the municipal government.

6.3 Site Rules and Regulations

At the time of the survey, the site management had not prepared or published any rules governing the operation of the solid waste disposal system. Periodically, however, the municipal government distributes regulations for the disposal of wastes.

6.4 Limitations on Disposal Volume and Service Charges

SFA and SFD residents are allowed a maximum of 2 cans per pickup. MFLR residents are limited to the equivalent of one 30 gallon can per week. There is a $5.00 per pickup charge for the removal of bulky wastes.

There is no direct charge to residents for the regular trash collection by the municipal government.

SECTION 7

RESIDENTS' SOLID WASTE DISPOSAL REQUIREMENTS AND PRACTICES

This report section contains all the data describing the solid waste items which are disposed by residents, their methods of disposal and use of equipment for such disposal. These are discussed in the framework of the limited site rules and regulations governing disposal practices. The subjects contained in this section are:

- Bulky waste disposal
- Separation of wastes
- In-house solid waste storage practices
- External solid waste storage practices (single family houses)
- Location of disposal site (Apartments)

7.1 Disposal of Bulky Wastes

The principal issues regarding bulky waste disposal and collection practices will be presented here. These issues include:

- Site management or trash disposal service rules and regulations for bulky waste disposal and collection
- Placement of large and small bulky wastes
- Identification of responsibility for large and small bulky waste collection
- Mode of collection of large and small bulky waste items

7.1.1 Site Rules and Regulations

There are no site management rules or regulations governing the disposal and collection of bulky waste at Greenfair.

7.1.2 Placement of Large and Small Bulky Wastes

Small bulky waste includes yard wastes, small appliances and bulky cardboard items. Large bulky waste includes such items as furniture and non-working major appliances.

Of the 152 respondents at this site, 27 percent (41) separate small items out of their regular trash for collection while 97 percent (148) separate large bulky items from their regular trash. Residents at this site place most frequently place small bulky wastes in a central collection bin for disposal. SFA residents usually place large bulky items adjacent to their homes for collection.

7.1.3 Responsibility for Bulky Waste Collection

The responsibility for the removal of bulky wastes rests upon each resident. The respondents indicate a variety of available sources for bulky waste collection. Fifty-two percent of the respondents feel that local government is available for the removal of small wastes. One third of the respondents don't know how to have large bulky items removed. Figure 6 presents data on respondent understanding of bulky waste removal responsibility.

	Small Items	Large Items
Local Government	52%	4%
Management	21	3
Taken to Dump	21	60
Private Collection Service	9	41
Don't Know	22	33
Total	100	100

FIGURE 6: RESIDENT UNDERSTANDING OF BULKY WASTES DISPOSAL RESPONSIBILITY

7.1.4 Mode of Bulky Waste Collection

Bulky wastes are disposed by collection in the regular trash pick-up, collection by "special" pick-up, and pick-up requested by the resident.

Fifty-six percent (61) of the single-family unit respondents indicate that small bulky items are collected with their regular trash. Eighty-six percent (37) of the MFLR respondents report that the small bulky items are collected with their regular trash.

Four percent (4 out of 109) of the single-family unit respondents report that large bulky items are removed with their regular trash collection; for MFLR respondents the figure is 7 percent (3 out of 43).

Sixty-seven percent (73 out of 109) state that they don't know how to have large bulky items removed. The same percentage (27 out of 43) of MFLR respondents don't know how to arrange pick-up of a large bulky item.

7.2 Separation of Waste

There are no site rules which require residents to separate bulky wastes, glass, plastics, newspapers, food wastes, or other items before collection.

Figure 7 presents the respondents' frequency, in number of cases and by percentage, for waste separation. Most residents (98 percent) do not separate their household trash.

Resident Action and Items	Percentage of Residents	Number of Cases
Separate Household Trash Items:		
Bulky Items	1%	2
Food Wastes	1%	2
Newspapers	0.7%	1
Frequency of Trash Separation	2%	3
Frequency of Non-Separation	98%	149
TOTAL	100%	152

FIGURE 7: EXTENT OF RESIDENT TRASH SEPARATION

2.3 In-Home Solid Waste Storage

The primary in-home solid waste container types used by site residents are: grocery bags with or without a trash can, plastic trash bags with or without a trash can, unlined cans, and in-house trash compactors.

Seventy percent (107) of the respondents use grocery bags for in-house storage while 15 percent (22) of the respondents use plastic trash bags for that purpose. Thirteen percent (20) use unlined cans and 2 respondents (1 percent) store their trash in in-house trash compactors.

Respondents store the following items in their in-house containers: paper and packaging, glass bottles, plastic items, cardboard items, newspapers, magazines, food wastes and cans.

Figure 8 presents the number and percentages of respondents who reported the types of waste they store in their in-house containers.

Type of Waste	No. of Responses	% of Responses
Paper/Packaging	150	98%
Glass Bottles	148	97
Plastic Items	148	97
Cardboard Items	144	95
Newspapers	91	60
Magazines	63	41
Food Wastes	104	68
Cans	1	1

FIGURE 8: TYPE OF WASTES STORED IN IN-HOUSE CONTAINERS

Respondents from all housing types fill their in-house containers an average of 3 times weekly. Some respondents report daily or more frequent in-house container filling practices.

In-House Storage Fill-up Characteristics	HOUSING TYPE	
	SFA	MFLR
Average times fill-ups per week	3.3	3.3
Number and percent reporting three or more fill-ups per week	89 of 98 (91%)	38 of 43 (88%)
Number and percent reporting daily or more than daily fill-up	44 of 98 (45%)	21 of 43 (49%)

FIGURE 9: FREQUENCY OF FILL-UP IN HOME STORAGE CAPACITY, BY HOUSING TYPE

7.3.1 Use of Trash Compactors

Two respondents (both are SFA residents) state that they use in-house trash compactors. Both have lived at Greenfair for 18 months; the head of one of the households with a compactor is retired.

7.4 External Solid Waste Disposal Practices

The practices for storage and disposal of solid wastes outside the home are related to the type of housing unit. For single-family homes, solid wastes in excess of the in-home storage capacity must be placed outside the interior living space until the exterior container is filled. The apartment dwellers excess storage is provided outside by the dumpster containers.

7.4.1 External Storage - Single Family Residents

Respondents use three types of external storage containers: metal cans, plastic cans and plastic bags. The trash is stored in plastic bags and metal and plastic cans outside their house for collection by a contract hauler.

Eighty-one percent of the single family residents report limitations on the volume of trash collected by the hauler.

7.4.2 External Storage - Apartment Residents

All of the MFLR respondents carry their household wastes to one of several dumpsters near the buildings. Twenty-two percent (8 of 36) of the respondents carry their trash from 50 to 100 feet to a dumpster; 25 percent must carry their trash over 100 feet to a dumpster. The average distance each respondent must carry his trash to a dumpster is 42 feet.

SECTION 8

RESIDENTS' UNDERSTANDING OF THEIR RESPONSIBILITIES COSTS AND FREQUENCY OF SERVICES

This report section examines quantitative and qualitative data from interviews with site management personnel and residents. The focus of this section is on establishing resident awareness of site management policy, arrangements and responsibility for solid waste collection services, payments for collection services, and the frequency of such services.

8.1 Responsibility for Solid Waste Collection

8.1.1 Household Trash

The management respondent states that the collection of household trash for all types of dwelling units is performed by local government. Resident awareness of the provider of collection services is mixed. Eighty-four percent (91) of the 109 single-family respondents are aware of local government's role in providing these services. Thirteen percent (14) of the 109 single family unit respondents think that management provides this service.

Some 72 percent of the MFLR respondents think that site management provides the collection service. Only 28 percent of these respondents are aware of their municipal government's role in collecting their wastes.

8.1.2 Bulky Wastes, Including Yard Wastes

The property management respondent states that yard maintenance for all single-family dwellings at this site is the responsibility of each resident. The responsibility includes the removal of all yard wastes. Special collection services are obtained when the resident places his yard wastes in the street and phones the municipal collection service.

In view of the resident's responsibility for waste removal, the diversity of responses cited as sources for bulky waste removal is probably indicative of resident resourcefulness in this area.

Just over half (79) of the respondents see local government as a source for the removal of small bulky items; however, only 3 percent (4) of the respondents feel that large bulky wastes would be removed by local government. Twenty-one residents (14 percent) think that site management is available to remove small bulky items and 3 (2 percent) think management is available for the removal of large bulky items. Twenty-one respondents (14 percent) would take their own small bulky wastes to a dump, while 60 respondents (39 percent) would take their large bulky wastes to a dump. Twenty-two (14 percent) of the respondents don't know how to get small bulky wastes collected and 33 (22 percent) don't know whom to consult for the removal of large bulky items.

8.2.1 Resident Awareness of Type of Changes

Over one third (51 of 152) of the respondents report additional charges for the removal of small bulky items; 32 percent (49 of 152) report no additional charges for that service. Seventy-four percent (112) do not know if there are extra charges for the removal of large bulky items; 32 (21 percent) of the respondents are aware of an additional fee for collection of large bulky items.

Twelve respondents (all of the SFA residents) feel that the charges for the collection of wastes are too high. Forty-nine single-family unit respondents feel that costs are "about right." Ninety-eight (90 percent) express no opinion about the suitability of the charges for waste collection.

8.3 Frequency of Services - Resident vs. Management Perceptions

This section compares management and resident perceptions of the frequency of regular trash collection services.

8.3.1 Single-Family Homes

All 109 of the single-family unit respondents report weekly trash collection as did the management respondent.

Eighty-one percent (88) of the respondents report a limitation on the number of containers they are allowed to fill for weekly collection. However, only 41 percent (45) are correctly aware that the limit restricts them to 2 cans per pickup. Any number of cans above this limit is subject to additional charges.

About 22 percent (24) of the single-family unit respondents report that overloading is never a problem. The most frequently mentioned cause of overloading is household trash, mentioned by 66 percent (72) of the respondents.

8.3.2 Apartments

Trash is collected daily from the dumpsters used by MFLR residents at this site. Of 28 MFLR residents who responded to questions about the adequacy of the storage containers, 12 (43 percent) find the containers adequate. The major reasons for container inadequacy are "too few containers" (9 mentions) and "misfitting covers" (10 mentions).

Generally, the trash collection arrangements for multi-family unit dwellers are adequate. However, overloading of external storage containers is of concern to single-family unit residents.

SECTION 9

SUITABILITY OF THE SOLID WASTE DISPOSAL SYSTEM TO THE ENVIRONMENT

The major environmental concerns to both management and the residents are noise, odors, trash spillage causing littering effects, pests (insects and vermin), nuisances caused by household pets, and effects of weather causing flooding in trash storage areas and littering. To assess the suitability of the system to the environment residents were asked for their opinions on such unpleasant environmental effects which they encountered as a result of using the solid waste collection facilities and services. Their perceptions are presented below in terms of either apartments or single family homes.

9.1 Environmental Impacts Perceived by Apartment Dwellers

Over half (16) of the 28 apartment residents at this site who responded to our questionnaire report that their present form of waste disposal did not afford adequate protection from environmental concerns.

Inadequate protection from the effects of weather is one of the most frequently mentioned (13 times) deficiencies of the multiple family units' disposal system. Another problem (13 mentions) with effects on all apartment occupants is odors in the waste disposal system. Insects (3 mentions) and inadequate protection of trash from dogs (6 mentions) also pose problems to respondents.

9.2 Environmental Impacts Perceived by Single Family Home Dwellers

About 36 percent of the residents of single family units feel that their waste disposal system is inadequate. Further, their responses indicate that dissatisfaction with the disposal system increases with tenure at the site.

More residents of attached single family units report inadequate disposal system (39 percent) than residents of detached units (9 percent). Expressions that the facilities are inadequate are fairly well distributed throughout most of the varied housing arrangements of adults and children.

Respondents from single family homes cite vulnerability to household pets as the greatest deficiency in the waste disposal system (27 mentions). The system's susceptibility to the effects of weather is the next major problem (17 mentions). Insects (10 mentions), vermin (1 mention), and odors (13 mentions), also plagued the systems in operations.

The major reason given (29 mentions) for those problems with the disposal system is misfitting covers.

Thirty-two percent of the respondents reported weekly overloading of their external storage facility, although overloading tends to diminish somewhat with tenure. The problems of weekly overloading is reported with greater frequency (32 mentions) by residents of attached homes than by residents of detached dwellings (3 mentions). It is of some interest that only 13 percent of the respondents reported that overloading is never a problem. Household is the leading contributor to overloading.

SECTION 10

OVERALL RESIDENT ATTITUDES TOWARD THE OPERATION AND MANAGEMENT OF THE SITE SOLID WASTE DISPOSAL SYSTEM

This final section of the report includes a measure of the attitudes and impressions of site residents concerning the operation and effectiveness of their solid waste disposal system and its component facility and services subsystem The principal components investigated were:

- trash compactors
- external storage cans and bins
- trash collection services

The major points of inquiry used to measure specific and overall resident attitudes were:

- frequency of use
- mechanical failures (for equipment)
- adequacy of capacity of equipment
- regularity of service (e.g., trash collections)
- potential dangers
- environmental impact
- convenience of components for resident use
- responsiveness of the system in resolving problems

10.1 Resident Attitudes About Suitability of Facilities and Equipment

10.1.1 Trash Compactor

Two respondents use in-house trash compactors at this site. One compactor owner, the retired resident of an SFA unit, has no problems with his compactor. Trash odor, however, is a problem encountered by the other compactor owner.

10.1.2 External Waste Storage Facility - Single Family Homes

Sixty-four percent (70) of the single family respondents find the external waste storage containers adequate. The 39 respondents (36 percent) who find the containers inadequate also encounter a variety of container-related problems.

Among the problems cited are: odors (which 13 SFA respondents cite), trash scattering by household pets (27 respondents cite this problem), insects (10 respondents), weather scattering of trash (affects 17 respondents) and vermin (1 respondent).

The container deficiencies which respondents blame for these inadequacies are: a shortage of containers (3 respondents cite this as a cause of inadequacy), and missing or misfitting covers (31 respondents see this as the major cause of container inadequacy).

10.1.3 External Waste Disposal Facilities - Apartments

Fifty-seven percent (16 out of 28) MFLR respondents find their waste disposal facilities inadequate. "Misfitting covers" or "missing covers" (which 12 respondents cite) and "too few cans" (which 9 respondents cite) are blamed as the major causes of disposal facility inadequacy. Two of the respondents state that the trash room is too small, 2 complain that containers are not emptied frequently enough, and 5 respondents say that all of the residents don't use the facility.

Weather scattering of garbage is seen as a result of these container inadequacies by 13 respondents. Six respondents complain about household pets getting into the trash, and odors (5 respondents) and insects (3 respondents).

10.2 Attitudes About Movement of Wastes to Disposal/Collection Point

10.2.1 Single Family Home Dwellers

Ninety-three (85 percent) of the single family unit respondents don't have to move their external storage containers to a collection point. Fourteen of the single family respondents who must move their storage containers to curbside transport them less than 50 feet. One SFA respondent moves his trash can between 50 and 100 feet to his curbside. Eighty-eight of the 98 SFA respondents see no danger in the movement of their containers. However, 8 respondents think improper lighting creates a danger of falls, 2 fear criminal assault, 4 feel exposure to the weather creates hazards, and 1 fears acquiring a physical disability from carrying his container.

10.3 Complaints About Waste Collection Services

Residents of single family homes were specifically asked about the adequacy of the waste collection service provided by the contract hauler. MFLR dwellers normally have little and infrequent contact with waste collection as, in essence, their contact with the system stops after they have placed their trash in the dumpster.

In sum, the complaints from single family residents covered virtually every category included in the survey.

The tenure of the resident is (in the opinion of the author) the major indicator of the validity of a complaint. Respondents who have lived at the site for longer periods will have more occasion to observe a greater frequency of problem situations. Overall, many of the complaints which are registered are made by residents with more than one year's tenure. Figure 10 presents the complaint categories in terms of the complainant's period of tenure.

Type of Complaint	Length of Residency			
	6 months or less	7 months up to one year	More than one year	Total Number of Complaints
Cans unemptied	0	1	5	6
Disturbance:				
Noisy trucks	1	0	5	6
Can Handling	0	1	5	6
Noisy Equipment	0	1	1	2
Rudeness	0	1	1	2
Missed Stops	0	1	0	1
Trash Spilled	6	7	21	34
Cans Damaged	3	4	6	13
Uncollected Items	9	2	10	21
TOTAL	19	17	53	89

FIGURE 10: TENURE OF COMPLAINANTS

10.4 Attitudes About Problem Resolution

Respondents were asked whom they would contact if they encountered a trash collection problem. Thirty-nine percent (59) indicate they would contact site management. Sixty percent (91) indicate that they would contact the municipal government.

10.5 Most (83 percent) of the respondents have had no problems with the disposal system at this site. Of the 23 respondents who have encountered problems with the collection service, 7 respondents report that their problems are unresolved.

Resident Attitudes About the Cost of Collections

Eight percent (12) of the residents feel that the cost of waste collection is "too high." Twenty-six percent (8) of the respondents feel that the cost of this service is "about right."

10.6 Resident Awareness of Service Providers and Innovations

The relatively low level of MFLR respondent involvement with the trash collection system is reflected in the incorrect identification of the service provider by single family unit respondents.

Eighty-three percent of the single family unit respondents correctly identify the provider of collection services as a municipal agency.

Resident awareness of innovations in use at the site are fairly low. Ninety-five percent of the respondents are unaware of any innovations in use at the site. The question was asked of them in a way which would not bias their awareness. If they answered that they are not aware of innovations, then identification of the innovations was not requested. In short, no prompting or extensive probing of respondents was attempted to ensure that their awareness was unaided.

Innovations the respondents mention are:

- Dumpsters - 1 SFD and 4 SFA respondents are aware of this innovation
- Large Mobile TCA - 2 SFD respondents are aware of this innovation.

APPENDIX A

SURVEY PROCEDURES

To conduct the survey of eight Operation Breakthrough sites, Applied Management Sciences undertook seven major activities: questionnaire design, development of a sampling plan, submission of instrument to OMB, design of table shells and an Analytic Plan, development and implementation of field interview procedures, development and application of editing and coding procedures, and data processing and analysis of results. Each of these activities is discussed below.

Questionnaire Design

At the start of the project a "rough draft" resident questionnaire was provided to Applied Management Sciences as a basis from which to build a set of survey instruments. Two instruments were developed, a resident questionnaire and a site management questionnaire. Inquiry categories in the "rough draft" instrument were carefully reviewed to ensure that all study objectives were being addressed and all appropriate issues were included. In a number of instances additional lines of inquiry were identified. Next the wording of each question was carefully reviewed by Applied Management Sciences' survey specialists to ensure that wording was clear and concise. Then the questionnaires were formatted to ensure ease of use by survey personnel and by our editing staff. Finally, the questionnaires were reviewed by Applied

Management Sciences' executives to determine if the inquiry flow and logic were consistent and smooth. Significant changes were made at each step of the process.

Upon completion of internal review, Applied Management Sciences forwarded the instruments to Hittman Associates for review and approval. Again, several revisions were made based on comments by HAI personnel. The questionnaire was then forwarded to the appropriate project personnel at the Environmental Protection Agency and the Department of Housing and Urban Development.

Development of a Sampling Plan

A total of 2,794 housing units was developed at the original nine Operation Breakthrough sites to be surveyed. Of these, 1,504 are multi-family units, - high, medium and low rise - and 1,290 are single-family homes, both attached and detached. To obtain a minimally acceptable error of 10 percent, at a confidence level of 90 percent, a sample size of 1,184 homes was chosen. This sample was drawn from site management estimates of the total population of occupied housing at each site at the time of the survey. The sample size was arrived at by calculating site subsamples on a total occupied unit basis, ranging from 70 to 100 percent for each type of housing at each site. Sample size, on a site basis by housing type, is presented in Figure 7.

The St. Louis site was subsequently eliminated from the survey due to non-cooperation of its site manager, bringing the final sample size down to 1,023.

Submission of Instruments to the OMB

Following receipt of comments from EPA and HUD personnel the survey instruments were again revised. Then, Applied Management

Site	Housing Type				Total Sample Size
	SFA	SFD	MFLR	MFH/MR	
Indianapolis	77	46	9	21	153
Jersey City	N/A	N/A	4	160	164
Kalamazoo	61	7	25	25	118
King County	38	46	13	N/A	97
Seattle	N/A	N/A	42	N/A	42
Macon	66	8	19	36	129
Memphis	22	N/A	114	32	168
Sacramento	98	11	43	N/A	152
St. Louis	28	N/A	56	77	161
TOTAL	390	118	325	351	1184

FIGURE 7 : SAMPLE SIZE BY HOUSING TYPE AND BREAKTHROUGH SITE

Science: prepared a justification statement for the Residents Questionnaire and an SF 83 form and submitted the documentation to Hittman Associates to be forwarded to OMB through EPA. OMB approval was not required on the Site Management Questionnaire as the survey universe was less than 10 persons.

Design of Table Shells and Analytic Plan

A total of 44 tables was developed to facilitate the analysis of the residents' survey results. The major areas of analysis included:

- Practices and needs of residents in disposal of their bulky wastes, separation of wastes, in-house waste storage, external waste storage and location of disposal sites.
- The residents' understanding of their responsibilities for trash disposal stemming from site rules and regulations.
- Resident awareness of costs and charges for solid waste collection and disposal services and frequency of services.
- Resident perception of the suitability of their site's solid waste disposal system to the environment noting specific incidence of the extent of noise, odors, trash spillage, pests, nuisance caused by uncontrolled household pets, and weather effect.
- Resident attitudes towards the operation and management of the site's solid waste disposal system, with particular attention to incidence of frequency of use, mechanical failure of equipment, adequacy of equipment capacity, regularity of service, potential dangers, convenience of system components, environmental impact and responsiveness of Site management and trash service providers in resolving problems.

For analytical purposes at each site these research areas were cross-tabulated against the following types of resident characteristics:

- Type of dwelling

- Retirement status
- Number of residents per household, by adults and children
- Frequency of In-house storage capacity fill-up per week
- Presence of compactors
- Trash separation requirements
- Number of storage cans per week
- Provider of trash collection service, e.g., municipal agency, housing management, private contractor, and so forth
- Tenure at site, in months.

The results of such analyses were then to be compared with the attitudes, impressions and statements on operations characteristics expressed by site management personnel, including site rules and regulations to arrive at an overall conclusion on the acceptability and suitability of the solid waste disposal system at each site. A final analysis plan, comparing each site against all the other sites, was also developed.

Field Interview Procedures

During the period of OMB review, Applied Management Sciences developed an interview protocol and manual to guide field interview staff in the appropriate use of the survey instruments. Interview personnel were selected and trained in each area and credentials were issued. Site management personnel were alerted to the interview dates and given information about the interview procedure during the course of the site management interviews which were conducted in January, 1975.

Resident survey formats were printed and distributed to each interviewer and the survey was begun on February 3, 1975. Most of the interviewing was conducted during the evening hours to minimize the need for follow-ups. Interviewing was completed on March 31, 1975.

Editing and Coding Procedures

Editing and coding manuals were prepared during the time that the survey instrument was under OMB review. Editors and coders were briefed and trained and the processing was begun on February 21, 1975. All 1,023 resident interviews were completed at a satisfactory level of response and acceptable quality of data collection. To accommodate the peculiarities of each site, special codes were developed to reflect individualized responses in the survey results. Editing and coding activities were completed on April 30, 1975.

Data Processing and Analysis

At the completion of editing and coding activities a keypunch card format was developed and sent with the editing and coding manual and resident questionnaires to be keypunched and verified. EDP cards were then listed and checked for errors and the file errors were corrected.

The program chosen to build the master file, sub-files (each site) and tabular output was the Statistical Package for Social Sciences (SPSS) - Version Six. Using this program we developed summary listings of all variables, tabular listings of variable frequencies, initial cross-tabulation formats and sub-files for each site. When all of these had been run and checked we proceeded to make a test run of one site which was reviewed and corrected. Finally, tables for all the other sites were run and produced. Information contained in these tables was used, in conjunction with our report outline and analytic plan to prepare the attached findings, conclusions and recommendations.

APPENDIX B

Site Management Questionnaire

SITE ADDRESS: ______________________________ ______________________________

NAME OF RESPONDENT: ______________________________ Telephone No.: ______________________________

1. COULD YOU GIVE US SOME INFORMATION ABOUT THE UNITS AT THIS SITE? WE ARE INTERESTED IN THE NUMBER OF EACH TYPE OF UNIT AND THEIR RANGE OF RENTAL OR SALES PRICE. FOR EACH OF THE FOLLOWING UNIT TYPES, WHAT IS THE:

	Number of Available Dwelling Units	Monthly Rent Range	(or)	Sales Price Range
a. *Multiple family high rise (5 or more stories)*	#______	$_____-_____		$_____-_____
b. *Multiple family low rise (4 or less stories)*	#______	$_____-_____		$_____-_____
c. *Single family attached*	#______	$_____-_____		$_____-_____
d. *Single family detached*	#______	$_____-_____		$_____-_____
Total units	#______			

NOTE: The following set of questions relate only to household trash and should have answers corresponding to the type of dwelling unit listed in the above question. Answers must be recorded in the proper columns relating to the various types of units.

	Column A: Mult Fam Hi Rise	Column B: Mult Fam Low Rise	Column C: Single Attach	Column D: Single Detach
2a. WHAT IS YOUR PERCENT OF OCCUPANCY LEVEL AT THIS POINT IN TIME? (Interviewer record date) _____/_____/_____.	______%	______%	______%	______%
2b. WHAT LEVEL DO YOU CONSIDER AS "FULL OCCUPANCY" (may be slightly less than 100%)?	______%	______%	______%	______%
2c. WHEN DO YOU ANTICIPATE REACHING "FULL" OCCUPANCY?	_/_/_	_/_/_	_/_/_	_/_/_
3a. REGARDING TRASH REMOVAL, DOES SITE MANAGEMENT PICK UP AT RESIDENCE AND REMOVE TO STORAGE/COMPACTION LOCATION FOR COLLECTION:				
Yes (Go to 3b.)	☐	☐	☐	☐
No (Go to 3c.)	☐	☐	☐	☐
3b. (IF YES ABOVE) WHAT IS THE FREQUENCY OF COLLECTION FROM STORAGE SITE?				
Less than once a week	☐	☐	☐	☐
Once a week	☐	☐	☐	☐
Twice a week	☐	☐	☐	☐
3-4 times a week	☐	☐	☐	☐
Daily (5 or more times a week)	☐	☐	☐	☐
3c. (IF NO ABOVE) WHO PERFORMS THE TRASH COLLECTION SERVICE?				
Local Government Service	☐	☐	☐	☐
Private Contract Hauler	☐	☐	☐	☐
No Provision - Residents Handle	☐	☐	☐	☐
Other ______________ *(Specify)*	☐	☐	☐	☐

	Mult Fam Hi Rise	Mult Fam Low Rise	[illegible] Attach	[illegible] Detach
3d. WHAT IS THE FREQUENCY OF THIS TRASH COLLECTION SERVICE?				
Less than once a week	☐	☐	☐	☐
Once a week	☐	☐	☐	☐
Twice a week	☐	☐	☐	☐
3-4 times a week	☐	☐	☐	☐
Daily (5 or more times a week)	☐	☐	☐	☐
4. IF THE SITE MANAGEMENT, A LOCAL GOVERNMENT AGENCY, OR A PRIVATE CONTRACTOR COLLECTS THE TRASH, WHERE ARE PICKUPS MADE?				
• *Basement trash collection facility*	☐	☐		
• *Trash collection facility on each apartment floor*	☐	☐		
• *Trash collection facility at the rear or sides of each residence*	☐	☐	☐	☐
• *Curbside at the front of each residence*	☐	☐	☐	☐
• *Outdoor central trash collection facilities for the site*	☐	☐	☐	☐
• *Other* ________ *(Specify)*	☐	☐	☐	☐
________	☐	☐	☐	☐
5. WHAT TYPE OF TRASH STORAGE AND HANDLING FACILITIES ARE PROVIDED FOR EACH OF THE VARIOUS TYPES OF UNITS?				
Trash Chute on each Apartment Floor	☐	☐		
Basement Trash Room	☐	☐		
Shredders	☐	☐		
Compactors	☐	☐		
Cans (Number per Trash Room)	#____	#____		
Outdoor Central Facility				
Bins (Number per Facility)	#____	#____	#____	#____
Cans (Number per Facility)	#____	#____	#____	#____
Compactors	☐	☐	☐	☐
Other ________ *(Specify)*	☐	☐	☐	☐
6. FOR SINGLE FAMILY UNITS, IF THERE IS A LIMIT TO THE NUMBER OF TRASH CANS/BAGS THAT CAN BE PICKED UP AT ONE TIME WITHOUT EXTRA CHARGE, WHAT IS THE LIMIT?				
No limit			☐	☐
2 cans per pickup			☐	☐
3 cans per pickup			☐	☐
4 cans per pickup			☐	☐
5 or more cans per pickup			☐	☐

7. WHAT DOES SITE MANAGEMENT EXPECT OF RESIDENTS IN TRASH HANDLING? *(Check as many as apply)*

	Column A: Mult Fam Hi Rise	Column B: Mult Fam Low Rise	Column C: Single Attach	Column D: Single Detach
Separate Different Types of Trash	☐	☐	☐	☐
Bag Trash in Plastic	☐	☐	☐	☐
Carry Trash to Chute	☐	☐		
Carry Trash to Basement Collection Facility	☐	☐		
Carry Trash to Outdoor Central Collection Facility	☐	☐	☐	☐
Place Trash in Bins	☐	☐	☐	☐
Place Trash in Cans	☐	☐	☐	☐
Compact Trash	☐	☐	☐	☐
Carry Trash to Curbside	☐	☐	☐	☐
Other ______________ *(Specify)*	☐	☐	☐	☐

8. HAS SITE MANAGEMENT OR THE COLLECTION AGENCY MADE AVAILABLE TO THE RESIDENTS ANY SPECIFIC WRITTEN TRASH REMOVAL REGULATIONS/PRACTICES/RULES?

Yes	☐	☐	☐	☐
No	☐	☐	☐	☐

Note: If yes, obtain most recent copy of all such regulations, etc.

9. WHAT IS THE METHOD AVAILABLE TO THE RESIDENT FOR:

(a) Requesting special collection service?* ________________________________

____

____

____

(b) Filing a complaint about trash removal service? ________________________________

____

____

____

**Special collections are those performed in addition to a regular collection and might be intended for yard waste or large bulky items.*

10. HOW ARE RESIDENTS CHARGED FOR REGULAR TRASH COLLECTION SERVICE?

	Column A: Mult Fam Hi Rise	Column B: Mult Fam Low Rise	Column C: Single Attach	Column D: Single Detach
Included in Basic Rent	☐	☐	☐	☐
Included in Resident Association Fees	☐	☐	☐	☐
Covered by Local Government Rates	☐	☐	☐	☐
Special Municipal Charge to Resident	☐	☐	☐	☐
Direct Private Collector Charge to Resident	☐	☐	☐	☐
Special Resident Association Charge	☐	☐	☐	☐
Other ______________ *(Specify)*	☐	☐	☐	☐

	Column A: Mult Fam Hi Rise	Column B: Mult Fam Low Rise	Column C: Single Attach	Column D: Single Detach
11. WHO CLEANS, DISINFECTS, OR OTHERWISE MAINTAINS TRASH COLLECTION FACILITIES:				
Residents	☐	☐	☐	☐
Site Management	☐	☐	☐	☐
Private Contract Collector	☐	☐	☐	☐
Local Government	☐	☐	☐	☐
Other ________ *(Specify)*	☐	☐	☐	☐

NOTE: THE FOLLOWING SET OF QUESTIONS RELATE TO YARD MAINTENANCE WASTES AND TO SPECIAL PROVISIONS FOR REMOVAL OF LARGE OR BULKY TRASH.

	Column A: Mult Fam Hi Rise	Column B: Mult Fam Low Rise	Column C: Single Attach	Column D: Single Detach
12. IS YARD MAINTENANCE PERFORMED BY:				
Site Management	☐	☐	☐	☐
Contract Yard Service	☐	☐	☐	☐
Residents	☐	☐	☐	☐
Other ________ *(Specify)*	☐	☐	☐	☐
13a. WHERE YARD MAINTENANCE IS PERFORMED BY RESIDENTS, WHAT ARE THE PROVISIONS FOR REMOVAL OF YARD WASTES?				
Collected with Regular Trash			☐	☐
Special Seasonal Collections			☐	☐
Collected upon Request of a Resident			☐	☐
Other ________ *(Specify)*			☐	☐
13b. ARE THERE ANY EXTRA CHARGES FOR REMOVAL OF YARD WASTES?				
No			☐	☐
Yes			☐	☐
13c. (IF YES ABOVE) WHAT ARE THE CHARGES PER BAG OR CAN?			$______	$______
14a. FOR LARGE OR BULKY TRASH ITEMS, WHAT ARE PROVISIONS FOR REMOVAL?				
Collected with Regular Trash	☐	☐	☐	☐
Collected upon Request of a Resident	☐	☐	☐	☐
No Provision	☐	☐	☐	☐
Other ________ *(Specify)*	☐	☐	☐	☐
14b. ARE THERE ANY EXTRA CHARGES FOR REMOVAL OF BULKY WASTES?				
No	☐	☐	☐	☐
Yes	☐	☐	☐	☐
14c. (IF YES ABOVE) WHAT ARE THE CHARGES PER PICKUP?	$______	$______	$______	$______

15a. DOES THE SITE MANAGEMENT MAINTAIN A RECORD OF COMPLAINTS RELATED TO TRASH COLLECTION SERVICE?

Yes ☐ *No* ☐

b. WHAT ARE THE MOST FREQUENT COMPLAINTS FROM

- *Single Family Attached:* ____________________

____

____

____

- *Single Family Detached:* ____________________

____

____

____

- *High Rise Units:* ____________________

____

____

____

- *Low Rise Units:* ____________________

____

____

____

____

INTERVIEWER: If complaint records data are available, request copy from site management for most recent reporting period, e.g., last month, quarter, etc.

APPENDIX C

Resident Questionnaire

Exp. Date - January 31, 1979
ID # ☐☐☐☐☐ cc1

RESIDENT QUESTIONNAIRE

Site Location ____________	Name of Respondent ____________
Date of Interview ____________	Telephone Number ( ) ____________

I. BACKGROUND DATA (Use For All Respondents)

(Card Code 1) cc6-1

The following are some general questions about yourself and the features of your residence (house or apartment):

1. TYPE OF DWELLING UNIT (BY OBSERVATION BEFORE INTERVIEW)

cc7-1 ☐ *Single family, detached*
-2 ☐ *Single family, attached*
-3 ☐ *Multiple family, Low Rise (4 stories or less)*
-4 ☐ *Multiple family, High Rise (5 stories or more)*

2. HOW MANY MONTHS HAVE YOU LIVED HERE? ____________ cc9,10

3. IS THE HEAD OF THE HOUSEHOLD RETIRED

cc11-1 ☐ *Yes* -2 ☐ *No*

4. HOW MANY ADULTS (18) YEARS OF AGE OR OLDER) AND CHILDREN LIVE HERE IN THIS HOUSE/APARTMENT?

A	B
cc12-1 ☐ *1 Adult*	cc13-0 ☐ *No Children*
-2 ☐ *2 Adults*	-1 ☐ *1 Child*
-3 ☐ *3 Adults*	-2 ☐ *2 Children*
-4 ☐ *4 or more Adults*	-3 ☐ *3 Children*
	-4 ☐ *4 or more Children*

The following questions concern some wastes other than your usual household trash. Let's consider two types of such wastes. These are (read the following definitions):

A	B
Yard Wastes/Small Appliances/ Bulky Cardboard Items	*Furniture/Large Appliances (stove, refrigerator)*

5. WHERE DO YOU PLACE THESE SPECIAL WASTES FOR PICKUP?

First, yard waste, small appliances and cardboard	Second, large waste like furniture, major appliances
cc14-1 ☐ *With regular household trash*	cc16-1 ☐ *With regular household trash*
-2 ☐ *Separated from regular household trash (circle one below)*	-2 ☐ *Separated from regular household trash (circle one below)*
cc15-1 ○ *curbside*	cc17-1 ○ *curbside*
-2 ○ *other area adjacent to residence*	-2 ○ *other area adjacent to residence*
-3 ○ *indoor trash storage area*	-3 ○ *indoor trash storage area*
-4 ○ *central site collection bin*	-4 ○ *central site collection bin*
-5 ○ *don't know*	-5 ○ *don't know*
-_ ○ *other* ____________ *(specify)* 6-9	-_ ○ *other* ____________ *(specify)* 6-9

6. WHO COLLECTS THESE SPECIAL WASTE ITEMS? (Check Only One)

First, yard waste, small appliances, and cardboard	Second, large waste like furniture, major appliances
A	B
cc18-1 ☐ Local government service	cc19-1 ☐ Local government service
-2 ☐ Management	-2 ☐ Management
-3 ☐ You take it to a dump	-3 ☐ You take it to a dump
-4 ☐ Private collection service	-4 ☐ Private collection service
-5 ☐ Don't know	-5 ☐ Don't know

7. HOW IS SPECIAL WASTE COLLECTION SERVICE PROVIDED? (Check Only One)

First, yard waste, small appliances, and cardboard	Second, large waste like furniture, major appliances
A	B
cc20-1 ☐ Regular general trash pickup	cc21-1 ☐ Regular general trash pickup
-2 ☐ Regularly scheduled "special" pickup	-2 ☐ Regularly scheduled "special" pickup
-3 ☐ You call the management or the city/private collector to request a pickup	-3 ☐ You call the management or the city/private collector to request a pickup
-4 ☐ Don't know	-4 ☐ Don't know

8(a) ARE THERE EXTRA CHARGES FOR SPECIAL WASTE COLLECTIONS (Check Only One)

First, yard waste, small appliances, and cardboard	Second, large waste like furniture, major appliances
A	B
cc22-1 ☐ Yes (if yes, go to 8b)	cc28-1 ☐ Yes (if yes, go to 8b)
-2 ☐ No charge (if no, go to next section)	-2 ☐ No charge (if no, go to next section)
-3 ☐ Don't know	-3 ☐ Don't know

(b) IF THERE ARE EXTRA CHARGES, WHAT ARE THEY? (Check Only One)

First, yard waste, small appliances, and cardboard	Second, large waste like furniture, major appliances
A	B
Charges are:	Charges are:
cc23-1 ☐ Per pickup	cc29-1 ☐ Per pickup
-2 ☐ Per cubic yard	-2 ☐ Per cubic yard
-3 ☐ Per pound	-3 ☐ Per pound
-4 ☐ Don't know	-4 ☐ Don't know
cc24-27 $ ___ . ___ Amount per above	cc30-33 $ ___ . ___ Amount per above

II. IN-HOME TRASH HANDLING

We'd like to know how you have to take care of trash within your House/Apartment. These questions concern the largest trash container you use in the house or apartment.

1. HERE IN THE HOUSE (OR APARTMENT), IN WHAT PRIMARY (i.e., kitchen or pantry container) TYPE OF CONTAINER DO YOU PUT YOUR HOUSEHOLD TRASH? (Check Only One)

Grocery bag

cc34-1 ☐ In trash can

-2 ☐ Without trash can

Plastic trash bag

-3 ☐ In trash can

-4 ☐ Without trash can

-5 ☐ Unlined trash can

-6 ☐ Compactor - household

-_ ☐ Other ________ (specify) 7-9

2. ABOUT HOW OFTEN DO YOU FILL YOUR PRIMARY IN-HOUSE CONTAINER (Check Only One)

cc35-1 ☐ Once per week

-2 ☐ Twice per week

-3 ☐ Three times per week (about every other day)

-4 ☐ Once a day

-5 ☐ More than once a day

3. WHAT KIND OF TRASH DO YOU PUT INTO THIS CONTAINER? (Check As Many As Apply)

cc36 ☐ Paper and packaging

cc37 ☐ Glass bottles

cc38 ☐ Plastic items

cc39 ☐ Cardboard items

cc40 ☐ Newspapers

cc41 ☐ Magazines

cc42 ☐ Food wastes

cc43-_ ☐ Other ________ (specify) 1-9

4. WHAT KINDS OF TRASH, IF ANY, ARE YOU ASKED TO KEEP SEPARATE? (Check As Many As Apply)

cc44 ☐ None

cc45 ☐ Glass

cc46 ☐ Bulky items

cc47 ☐ Plastic items

cc48 ☐ Food wastes

cc49 ☐ Newspapers

cc50-_ ☐ Other ________ (specify) 1-9

5. DO YOU HAVE A TRASH COMPACTER IN YOUR HOUSE/APARTMENT?

cc51-1 ☐ Yes

-2 ☐ No (Go to Section III)

6. ABOUT HOW OFTEN DO YOU FILL A COMPACTED BAG OF TRASH?

cc52-1 ☐ Don't use compactor

-2 ☐ Less than 1 bag/week

-3 ☐ 1-2 bags/week

-4 ☐ 3-4 bags/week

-_ ☐ 5 or more bags/week (Specify [illegible])

7. DO YOU HAVE ANY COMPLAINTS REGARDING YOUR COMPACTOR? (Check As Many As Apply)

cc53 ☐ No complaints

cc54 ☐ Compactor breaks down frequently

cc55 ☐ Compactor breaks down occasionally

cc56 ☐ Odor problem

cc57 ☐ Noisy

cc58-_ ☐ Other ____________ (specify) 1-9

III. TRASH TRANSFER OPERATIONS

(Interviewers Note: Use "House" or "Apartment" section, as appropriate)

HOUSE (Card Code 2) cc6-2

The following questions are about the removal of trash from the house to a storage area.

1(a) WHAT KIND OF STORAGE CONTAINER DO YOU USE TO STORE YOUR TRASH?

cc7 ☐ Plastic cans

cc8 ☐ Metal cans

cc9 ☐ Plastic bags

cc10 ☐ Compactor bags

(b) HOW MANY CANS OR BAGS DO YOU FILL ON THE AVERAGE EACH WEEK? (Help compute if respondent answers with other than "weekly" reference.)

cc11,12 ______________/week

2. WHERE DO YOU KEEP YOUR STORAGE CONTAINERS FOR YOUR ACCUMULATED TRASH UNTIL IT IS COLLECTED? (Answer Only One)

cc13-1 ☐ Basement
-2 ☐ Backyard
-3 ☐ Side yard
-4 ☐ No container: move trash to central collection bin or storage area (Skip to Question 6)
-5 ☐ Garage
-6 ☐ Driveway
-_ ☐ Other ______________ (specify) 7-9

3. IF YOU MUST MOVE YOUR STORAGE CONTAINERS FOR PICKUP:

(a) WHERE DO YOU HAVE TO MOVE THEM?

cc14-1 ☐ Curbside
-2 ☐ Don't move (On-Premise or Carry-out collection service is received) - Go to No. 4
-_ ☐ Other ______________ (specify) 3-9

(b) HOW FAR DO YOU HAVE TO MOVE THEM?

cc15 ☐ Less than 50 feet

cc16 ☐ fifty to 100 feet

cc17 ☐ more than 100 feet

4. IS THERE A LIMIT TO HOW MUCH TRASH WILL BE COLLECTED FROM YOUR HOME AT ONE TIME?

cc18-1 ☐ Yes (If yes, what is the limit?)
cc19-20 No. ________ cans or bags/pickup (Go to Question 5)
-2 ☐ No (Go to Question 6)
-3 ☐ Don't know (Go to Question 6)

5. (IF YES ABOVE) MUST YOU PAY AN ADDITIONAL SERVICE CHARGE FOR EXTRA CANS OR BAGS OF HOUSEHOLD TRASH?

cc21-1 ☐ Yes (If yes, how much?)
cc22-25 $ ______ per can or bag
-2 ☐ No
-3 ☐ Don't know

6. DO YOUR TRASH STORAGE FACILITIES BECOME OVERLOADED BETWEEN COLLECTIONS? IF YES, HOW OFTEN DOES THIS OCCUR?

cc26-2 ☐ *No*

-3 ☐ *Yes - weekly*

-4 ☐ *Yes - about once a month*

-5 ☐ *Yes - but hardly ever*

7. IF TRASH STORAGE FACILITIES BECOME OVERLOADED, WHAT TYPES OF WASTE GENERALLY CAUSE THE PROBLEM? (Check Any Which Apply)

cc27 ☐ *Household trash*

cc28 ☐ *Yard wastes*

cc29 ☐ *Bulky items/appliances*

cc30-_ ☐ *Other* ______________ (*specify*) 1-9

8. IF THERE IS ANY PERSONAL DANGER POTENTIAL IN BRINGING YOUR TRASH TO THE COLLECTION POINT, WHAT ARE THEY? (Check As Many As Apply)

cc31 ☐ *No potential danger (Go to Question No. 9)*

cc32 ☐ *Inadequate lighting - danger of falling*

cc33 ☐ *Criminal assault*

cc34 ☐ *Inclement weather*

cc35 ☐ *Resident's physical problems*

cc36-_ ☐ *Other* ______________ (*specify*) 1-9

9. DO YOU FEEL THAT YOUR TRASH STORAGE CONTAINERS PROVIDE ENOUGH PROTECTION AGAINST ODORS, INSECTS, DOGS, VERMIN (RATS, MICE) AND WIND/RAIN?

cc37-1 ☐ *Yes (Go to Question 11)*

-2 ☐ *No*

(IF NO) WHAT ARE THE PROBLEMS ENCOUNTERED? (Check As Many As Apply)

cc38 ☐ *Odors*

cc39 ☐ *Insects*

cc40 ☐ *Dogs*

cc41 ☐ *Vermin (rats or mice)*

cc42 ☐ *Wind/Rain*

cc43-_ ☐ *Other* ______________ (*specify*) 1-9

10. IF THE CONTAINERS DO NOT PROVIDE ENOUGH PROTECTION, WHAT IS(ARE) THE REASON(S) FOR THE PROBLEMS? (Check As Many As Apply)

cc44 ☐ *Not enough containers*

cc45 ☐ *Lack of container covers*

cc46 ☐ *Covers don't fit tightly*

cc47-_ ☐ *Other* ______________ 1-9

11. HOW OFTEN IS YOUR TRASH PICKED UP? (Check Only One)

cc48-1 ☐ *Once a week*

-2 ☐ *Twice a week*

-3 ☐ *3-4 times a week*

-4 ☐ *Daily (5 or more times a week)*

-5 ☐ *Don't know*

12. **WOULD YOU PLEASE INDICATE ANY COMPLAINTS THAT YOU MAY HAVE ABOUT YOUR TRASH PICKUP SERVICE (Check As Many As Apply)**

cc49 ☐ No complaints, generally satisfied

cc50 ☐ Trash pickup not frequent enough

cc51 ☐ Trash cans not completely emptied

Collection creates a disturbance/noise:
(If so, check source)

Source

- cc52 ☐ Collection trucks are noisy
- cc53 ☐ Collectors' handling of trash cans
- cc54 ☐ Collectors' loud chatter and laughing
- cc55 ☐ Collection equipment itself is noisy

cc56 ☐ Collectors are rude or discourteous

cc57 ☐ Pickup dates are sometimes missed

cc58 ☐ Trash not picked up any specified day

cc59 ☐ Trash spilled

cc60 ☐ Cans dented, broken or damaged

cc61 ☐ Certain items not picked up

cc62 _ Which items ____________ (specify) 1-9

cc63 _ ☐ Other reasons ____________ (specify) 1-9

APARTMENT (Card Code 3) cc6-3

The following questions are about the removal of trash from your apartment to a disposal site and its storage there.

1. WHEN THE TRASH CONTAINER(S) IN YOUR APARTMENT IS(ARE) FULL, WHERE DO YOU TAKE IT(THEM)? (Check As Many As Apply)

cc7 ☐ *Trash chute*

cc8 ☐ *Trash room*

cc9 ☐ *Outside bin*

cc10 ☐ *Inside or outside compactor*

cc11-_ ☐ *Other* ____________________ *(specify)* 1-9

2. ABOUT HOW FAR IS IT FROM YOUR APARTMENT TO THE TRASH STORAGE/DISPOSAL AREA?

cc12-14 ____________________ *feet*

3. IF THERE IS NOT ADEQUATE TRASH STORAGE AT THIS STORAGE/DISPOSAL LOCATION, WHAT ARE THE REASONS? (Check As Many As Apply)

cc15 ☐ *Storage/Disposal* *is* adequate

cc16 ☐ *Not enough containers*

cc17 ☐ *Chute backs up*

cc18 ☐ *Trash room too small*

cc19-_ ☐ *Other problems* ____________________ *(specify)* 1-9

4. WHAT KIND OF PROBLEMS, IF ANY, DO YOU HAVE IN OPERATING THE CHUTE DOOR, BIN LID, CONTAINER COVER, OR COMPACTOR? (Check As Many As Apply)

cc20 ☐ *No problems*

cc21 ☐ *Chute door difficult to open*

cc22 ☐ *Bin lid or container covers difficult to open*

cc23 ☐ *Compactor is difficult to operate*

cc24-_ ☐ *Other problems* ____________________ *(specify)* 1-9

5. IF STORAGE CANS OR BINS ARE USED, DO THEY PROVIDE PROTECTION AGAINST INSECTS, ODORS, DOGS, VERMIN (RATS, MICE) AND WIND/RAIN?

cc25-1 ☐ *Yes (Go to Question 7)* -2 ☐ *No*

(IF NO) IF STORAGE CANS OR BINS ARE UNPROTECTED, WHAT PROBLEMS ARE ENCOUNTERED? (Check As Many As Apply)

cc26 ☐ *Odors*

cc27 ☐ *Insects*

cc28 ☐ *Dogs*

cc29 ☐ *Vermin*

cc30 ☐ *Wind/Rain*

cc31-_ ☐ *Other* ____________________ *(specify)* 1-9

6. IF THE CONTAINERS DO NOT PROVIDE ENOUGH PROTECTION, WHAT CAUSES THIS(THESE) PROBLEM(S)? (Check As Many As Apply)

cc32 ☐ *Not enough containers*

cc33 ☐ *Lack of containter/bin lids*

cc34 ☐ *Covers don't fit tightly*

cc35-_ ☐ *Other* ____________________ *(specify)* 1-9

7. IF THERE IS ANY PERSONAL DANGER POTENTIAL IN YOUR BRINGING YOUR TRASH TO THE STORAGE/DISPOSAL LOCATION, WHAT ARE THESE POTENTIAL DANGERS? (Check As Many As Apply)

cc36 ☐ No potential danger

cc37 ☐ Inadequate lighting - danger of falling

cc38 ☐ Criminal Assault

cc39 ☐ Inclement weather

cc40 ☐ Resident's physical problems

cc41-_ ☐ Other ____________
(specify) 1-9

IV. GENERAL QUESTIONS (Use For All Respondents)

(Card Code 1 - cont'd)

1. IF YOU HAVE A PROBLEM WITH TRASH COLLECTION, WHOM DO YOU CALL TO HAVE IT CORRECTED? (Check Only One)

cc59-1 ☐ *Site management*
-2 ☐ *City agency*
-3 ☐ *Private garbage collector*
-_ ☐ *Other* ____________ (specify) 4-9

2. IF YOU HAVE HAD ANY PROBLEMS WITH TRASH COLLECTION SERVICE, WERE THEY RESOLVED TO YOUR SATISFACTION?

cc60-1 ☐ *Yes*
-2 ☐ *No*
-3 ☐ *No problems*

3. WHAT CHARGES, IF ANY, DO YOU PAY FOR REGULAR TRASH COLLECTION?

cc61-64 (*Specify amount per time period*) $_ _._ _

cc65-1 ☐ *Weekly*
-2 ☐ *Semi-monthly*
-3 ☐ *Monthly*
-4 ☐ *Quarterly*
-5 ☐ *Semi-quarterly*
-6 ☐ *Annually*
-7 ☐ *Pickup*
-8 ☐ *Other*

cc66-1 ☐ *Don't know*
-2 ☐ *Don't pay directly*

4. CONSIDERING THE QUALITY OF YOUR TRASH COLLECTION SERVICES, HOW DO YOU FEEL ABOUT THE COST?

cc67-1 ☐ *Too high*
-2 ☐ *About right*
-3 ☐ *Inexpensive*
-4 ☐ *Aren't sure*

5. WHO PROVIDES YOUR TRASH COLLECTION SERVICE? (Check Only One)

cc68-1 ☐ *A municipal agency*
-2 ☐ *Housing management*
-3 ☐ *Trash collector hired by me*
-4 ☐ *Don't use trash collection service/take trash to disposal site myself (dump or*
-5 ☐ *Don't know*
-_ ☐ *Other* ____________ (specify) 8-9

6. ARE YOU AWARE OF ANY UNUSUAL OR NEW TECHNIQUES OR EQUIPMENT FOR REMOVAL OR COLLECTION OF SOLID WASTES (TRASH, ETC.) THAT ARE BEING USED HERE?

cc69-1 ☐ *Yes* -2 ☐ *No*

7. (IF YES ABOVE) WHAT ARE THESE NEW OR UNUSUAL TECHNIQUES OR FACILITIES?

cc70-1 ☐ *Dumpsters* -4 ☐ *Pneumatic trash chute*

-2 ☐ *Compactors* -_ ☐ *Other* ____________________

-3 ☐ *Trash chutes* ____________________
(specify) 5-9

Time Interview Began ____________________

Time Interview Ended ____________________

Interviewer ____________________